USER MANUAL

ATEQ ERD 520

Version 1.01

www.ateq.com

Reference: UM-21000B-U

ATEQ ERD 520 MANUAL UPDATES

Edition/Revision	Reference	Date week/year	Chapters updated
First edition	UM-21000A-U	16/2003	-----
Second edition	UM-21000B-U	25/2005	Evolution of the instrument from the 1.00 to the 1.01 version. Up dating the measurements characteristics in the preamble.

Recommendations for leak testing intruments

Precautions for the test environment

- Keep the test area as clean as possible.

Precautions for the operators

- **ATEQ** recommends that the operators using the instruments should have a suitable qualification and training with respect to the work bench requirements.

General precautions

- Read the user manual before using the instrument,
- all electrical connections to the instrument must be equipped with a safety system (fuse, circuit breaker…) appropriate to its needs and complying with the standards,
- to avoid electromagnetic interference, the cable connections to the instrument should be less than two meters in length,
- it is essential that the electrical main is earthed,
- disconnect the electrical connections to the equipment before maintenance,
- cut the air supply for any kinds of operation on the pneumatic assembly,
- do not open the instrument when it is powered up,
- avoid water spillage near of the instrument,
- **ATEQ** is at your disposal for any further information concerning the use of the instrument under maximum safety conditions.

We would like to bring to your attention that ATEQ will not be held responsible for any accident connected to the improper use of the instrument, to the work bench or to the lack of compliance with safety rules.

ATEQ, THE ASSURANCE OF A COMPETENT AFTER SALES SERVICE

■ THE ATEQ AFTER SALES SERVICE IS :

- a team of qualified technicians,
- a permanent telephone assistance,
- agencies close to you for faster reaction,
- a stock of spare parts available immediately,
- a car fleet for rapid intervention,
- a commitment to quality ...

■ THE OVERHAUL

ATEQ carries out the overhaul of your instruments at interesting prices.
The overhaul corresponds to the maintenance of the instrument (checking, cleaning, replacing of used parts) as part of preventive maintenance.
Preventive maintenance is the best way to guarantee reliability and efficiency. It allows the maintenance of a group of instruments in good operational order and prevent eventual break-downs.

■ MAINTENANCE KITS

The ATEQ After Sales Service proposes, two kits destined for the preventive maintenance of the pneumatic circuits of instruments.

■ CALIBRATION

This may be carried out on site or in our offices.
ATEQ is attached to the COFRAC and delivers a certificate following a calibration.

■ TRAINING COURSES

In the framework of partnership with our customers, ATEQ offers two types of training in order to optimise the usage and knowledge of our instruments. They are aimed at different levels of technician:

- method / control training,
- maintenance / upkeep training.

■ A TARGETED TECHNICAL DOCUMENTATION

A number of technical documents are at your disposal to allow you to intervene rapidly in the event minor breakdowns:

- problem sheets describing and offering solutions to the main pneumatic and electronic problems,
- several maintenance manuals.

■ A QUALITY GUARANTEE

The instruments are guaranteed for parts and labour in our offices:

- 2 years for leak detection equipment,
- 1 year for electrical tests to norms instruments,
- 1 year for the accessories.

Our After Sales Service is capable of rapidly answering all your needs and queries.

ATEQ recommends
to made realise by its departments
a revision and a calibration of the instruments
every year

PREFACE

Dear Customer,

You have just purchased an **ATEQ** instrument, we thank you for the trust you have placed on our brand. This instrument has been designed to ensure a long and unparalleled life expectancy, and we are convinced that it will give you complete satisfaction during many long years of operation.

In order to maximise the life expectancy and reliability of your **ATEQ** instrument, we recommend that you install this instrument on a secured workbench and advise you to consult this manual in order to familiarise yourself with the functions and capabilities of the instrument.

Our **ATEQ** After Sales Service centre can give you recommendations based on your specific operation requirements.

ATEQ

TABLE OF CONTENTS

Chapter 4 FUNCTIONS OF THE INSTRUMENT

Chapter 5 ACCESSORIES

Chapter 6 ERROR MESSAGES

Chapter 7 OPERATIONAL PROBLEMS

Appendicies ATEQ ERD 520

Index 87

PREAMBLE

1. DEFINITION

The **ATEQ ERD 520** is an electronic pressure regulator destined for assembly line control on subassemblies for which a flow or an electrical contact event is required when the pressure increases.

The **ATEQ ERD 520** can generate gradual pressure rises, steady levels of pressure and gradual decreases in pressure as well as chain several test cycles one after the other following pre-programmed conditions.

The instrument principle is based on the servo-control of a pressure regulator.

The **ATEQ ERD 520** comprises:

A) a pneumatic unit allowing:

- The filling of the part to the test pressure,
- The maintaining of the pressure during the pressure step time,
- The return to atmospheric pressure at the end of the cycle,
- The monitoring of the test pressure with a piezo electronic sensor for pressure regulation and switching.
- The measurement of the air flow applied to a part.

B) a programmable electronic board which memorises all the cycle adjustments, calculates, displays and transmits all the test results.

2. CHARACTERISTCS OF THE MEASUREMENT

2.1. PRESSURE DROP MEASUREMENT

RANGE L/H	ACCURACY	MAXIMUM RESOLUTION L/H
5	+/- (3% of the flow + 0,01 l/h)	0,001
30	+/- (3% of the flow + 0,06 l/h)	0,01
150	+/- (3% of the flow + 0,30 l/h)	0,1
500	+/- (3% of the flow + 1 l/h)	0,1
1500	+/- (3% of the flow + 3 l/h)	1

(20° / 1013 hPa)

2.2. TEST PRESSURE MEASUREMENT

RANGE	ACCURACY	MAXIMUM RESOLUTION
PE = 7.5 kPa *(PE < 75 mbar)*	+/- (1,5% of the pressure + 0,2 hPa)	0,1 % PE
PE < 30 kPa *(PE < 0,3 bar)*	+/- (1,5% of the pressure + 1 hPa)	
30 kPa ≤ PE ≤ 100 kPa *(0,3 bar ≤ PE ≤ 1 bar)*	+/- (1,5% of the pressure + 3 hPa)	
100 kPa < PE ≤ 500 kPa *(1 bar < PE ≤ 5 bar)*	+/- (1,5% of the pressure + 7.5 hPa)	
500 kPa < PE ≤ 1 MPa *(5 bar < PE ≤ 10 bar)*	+/- (1,5% of the pressure + 15 hPa)	
1 MPa < PE ≤ 2 MPa *(10 bar < PE ≤ 20 bar)*	+/- (1,5% of the pressure + 30 hPa)	

2.3. ELECTRONIC PRESSURE REGULATION

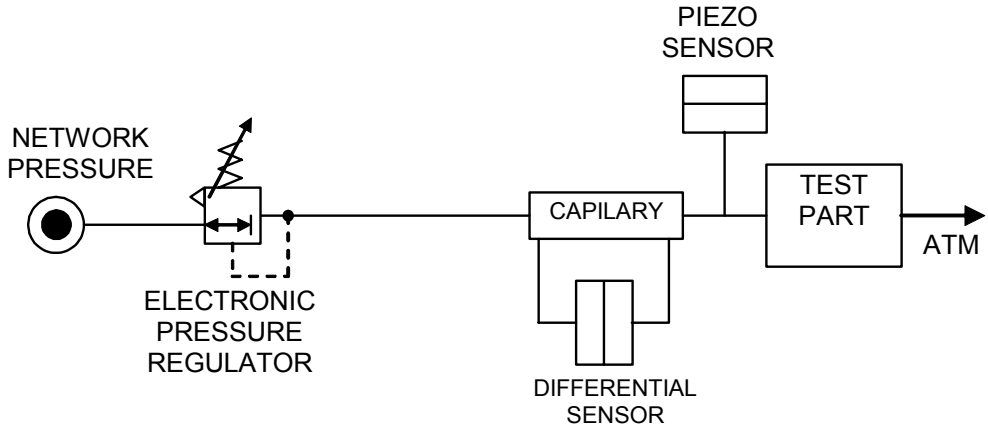
- 80 kPa to - 2 kPa / 1 kPa to 10 kPa / 10 kPa to 100 kPa / 20 kPa to 200 kPa / 50 kPa to 500 kPa / 100 kPa to 9000 kPa / 0.2 to 1.6 MPa.

3. THE OPERATION PRINCIPLE

There exists two measurement principles, the direct measurement and the indirect measurement. The configuration is determined by the application, and must be set using the instrument controls.

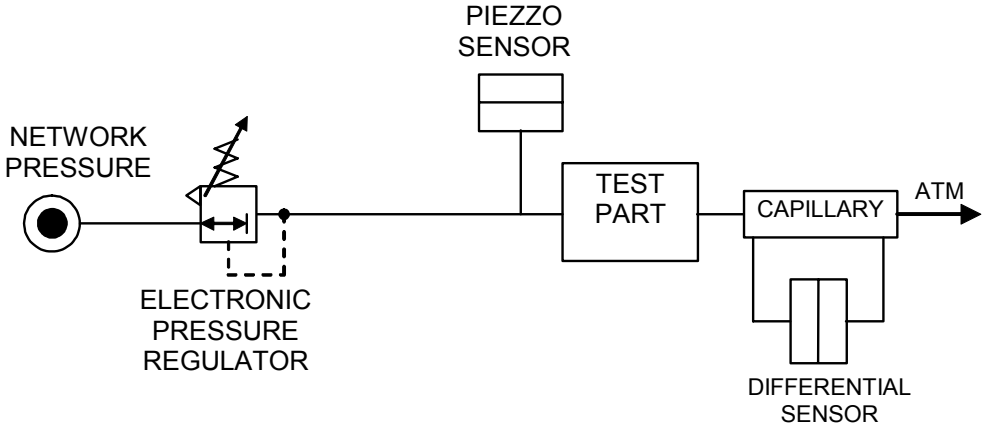
3.1. DIRECT MEASUREMENT

The direct measurement consists of positioning the part to be controlled behind the pneumatic circuit of the instrument thus releasing the flow to the atmosphere.



3.2. INDIRECT MEASUREMENT

The indirect measurement consists of inserting the part to be controlled before the flow measurement capillary which then releases the flow into the atmosphere.



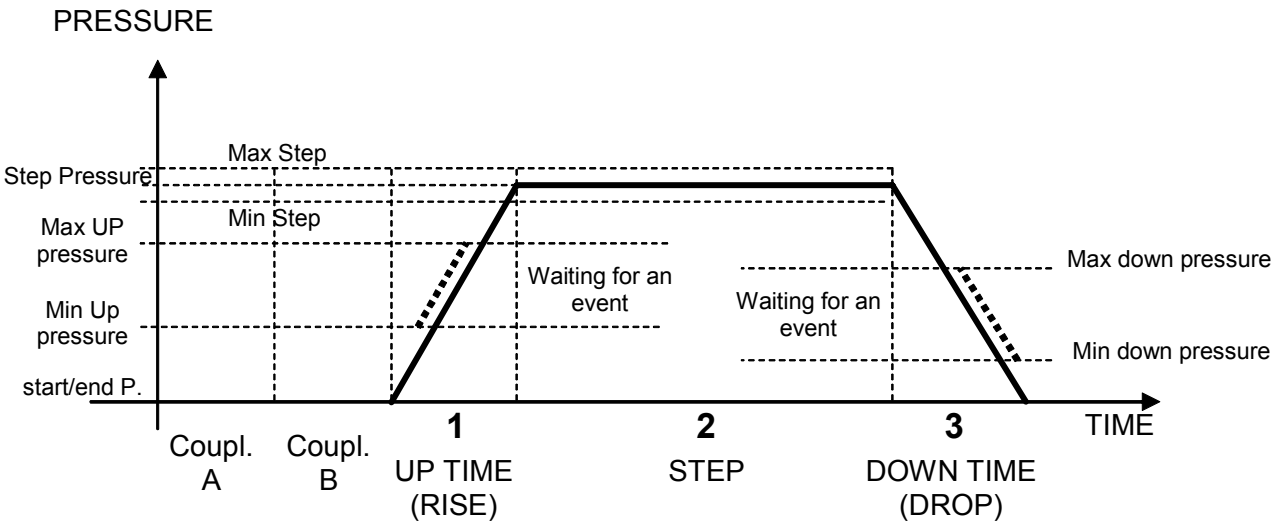
3.3. TEST CYCLE

The test takes place in three distinct phases**:**

1) **The rise (Pressure UP) time:** allows the gradual pressurisation of the test part. An event control can be carried out during the pressure rise (from start pressure to step pressure).

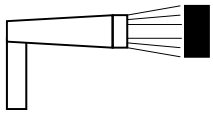
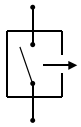
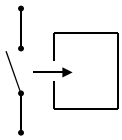
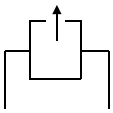
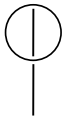
2) **The step time:** allows the measurement of flow with a constant pressure.

3) **The drop (Pressure DOWN) time:** progressively returns the test part to atmospheric pressure. An event control can be carried out during the pressure fall.



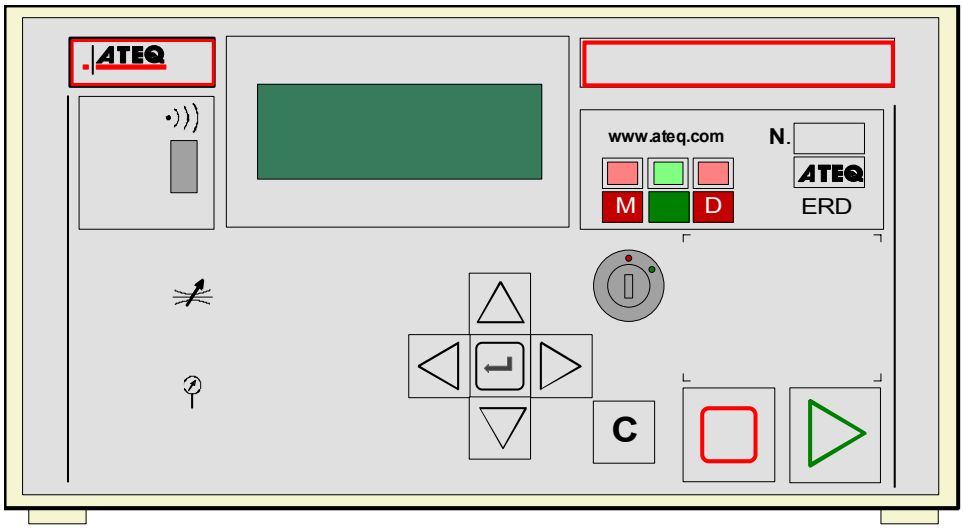
4. PRESENTATION OF THE SYMBOLS

Symbol	Name	Function
	Adjust leak connector	Pneumatic connector for the plugging of a calibrated leak (ruby kind) or an adjustable leak.
	Pressure connector	Pneumatic connector for the plugging of a manometer for an external checking of the pressure.
	Pressure supply	of the air supply from the 6 bar network.
	Test circuit supply	Pneumatic connector (according to option) for the plugging of a supplementary pneumatic supply, used in case of test pressure greater than 8 bar.
	Ground connector	Connector for the electric plugging to the ground.
	Automatic connector	Pneumatic connector for the driving of an external logic or pneumatic components (pneumatic sealing connector).
	Connector	Connector for pneumatic output.
	Connector	Connector for pneumatic input.
	Warning !	Read and respect the instructions of the user manual, before plugging and using the instrument.
	Remote control	Connector for a remote control.
	Printer	Connector for printer plugging.

Symbol	Name	Function
	Bar code reader	Connector for bar code reader plugging.
	Output	Dry contact output.
	Input	Dry contact input.
	Infrared link	Infrared link, at this place there's the receiver and transmitter of the infrared link.
	Analogue output	Analogue output.
	Analogue input	Analogue input for the temperature sensor.

Chapter 1
INSTALLATION OF THE INSTRUMENT

1. PRESENTATION OF THE ATEQ ERD 520



The **ATEQ ERD 520** is presented in a painted and formed metal case which rests on four feet. The upper cover is linked to the structure with 2 screws.

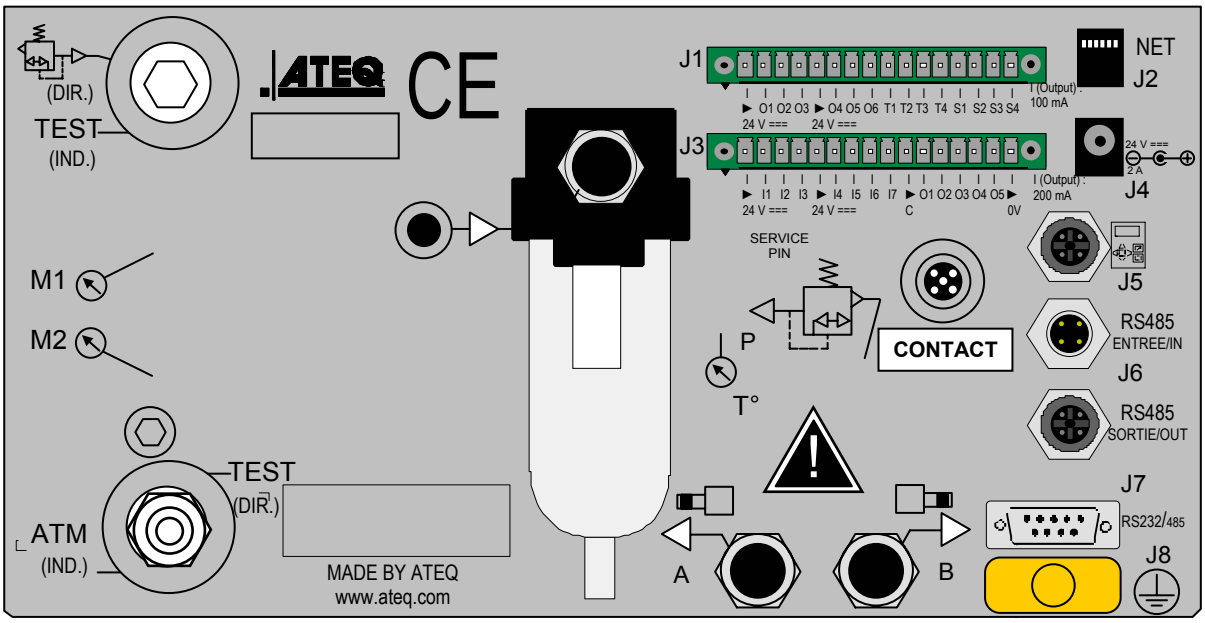
The format of the case has been reduced to allow easy insertion of the instrument.

The instrument is delivered with an external 24 V DC power supply.

2. INSTALLATION OF THE INSTRUMENT

2.1. PRESENTATION OF THE CONNECTORS ON THE ERD 520 CASE

2.1.1. ERD 520 without capillary

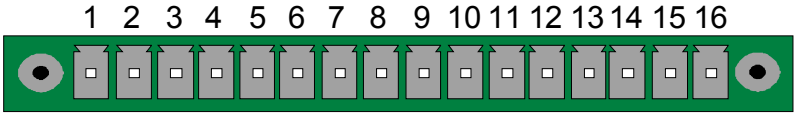


2.2. CONNECTOR INFORMATION

2.2.1. Electrical connectors

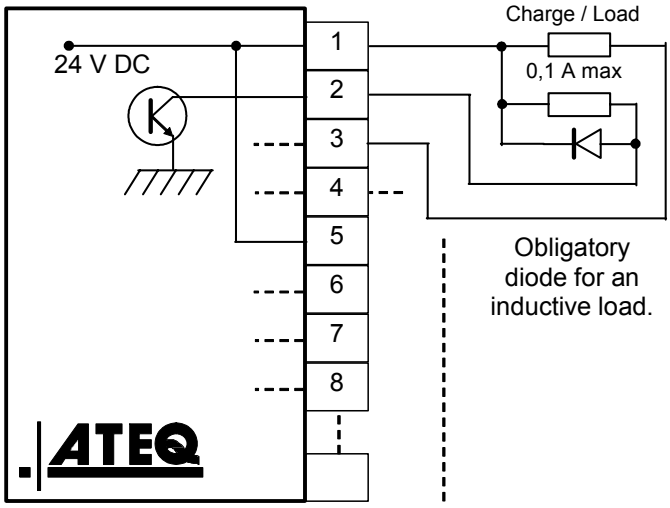
The **ATEQ ERD 520** operates under a power of 24V DC (transformer supplied) :

2.2.1. 1) J1 Connector (Output codes / analogue outputs / temperature sensors)



PIN 1	COMMON (outputs 1,2,3)	OUTPUT CODES 24V DC 100mA Max Outputs
PIN 2	Output n°1	
PIN 3	Output n°2	
PIN 4	Output n°3	
PIN 5	COMMON (outputs 4,5,6)	
PIN 6	Output n°4	
PIN 7	Output n°5	
PIN 8	Output n°6	
PIN 9	12V DC Sensor poser supply (2 mA max)	TEMPERTURE SENSORS
PIN 10	0V Sensor power supply	
PIN 11	Sensor input n°1	
PIN 12	Sensor input n°2	
PIN 13	Analogue output n°1	ANALOGUE OUTPUTS
PIN 14	COMMON (analogue output 1)	
PIN 15	Analogue output n°2	
PIN 16	COMMON (analogue output 2)	

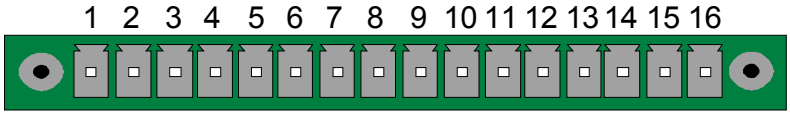
The analogue outputs are the rough signals: 4 – 20 mA or 0 – 10 V depending on the chosen option.



2.2.1. 2) J2 Connector

Phone network socket. Not used.

2.2.1. 3) J3 Connector (All or nothing Inputs/Outputs)



PIN 1	Reset input (input 1)	INPUTS (Activation by 24 V DC)
PIN 2	Common (+ 24 V)	
PIN 3	START input (input 2)	
PIN 4	Common (+ 24 V)	
PIN 5	Input 3 (program selection)	
PIN 6	Input 4 (program selection)	
PIN 7	Input 5 (program selection)	
PIN 8	Input 6 (program selection)	
PIN 9	Input 7 (reserved)	
PIN 10	Common	DRY CONTACT OUTPUTS 60V AC / DC Max 200mA Max
PIN 11	Good part output	
PIN 12	Fail part on the rise output	
PIN 13	Fail part on the drop output	
PIN 14	Alarm output	
PIN 15	Cycle end output	
PIN 16	0 V	

***Note:** when the bad part on the rise and drop outputs are validated at the same time, it corresponds to a bad step part. The errors on the rise or on the drop in pressure have priority over the step error.*

2.2.1. 4) Activation of a program on the J3 connector inputs

To activate a program from the J3 connector inputs, it is necessary to select pins 5 to 8 (one or more at a time). Binary weight n + 1.

Combinations of pins to be activated to select the programs

Program number	Pin 5 (input 3)	Pin 6 (input 4)	Pin 7 (input 5)	Pin 8 (input 6)
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0
9	0	0	0	1
10	1	0	0	1
11	0	1	0	1
12	1	1	0	1
13	0	0	1	1
14	1	0	1	1
15	0	1	1	1
16	1	1	1	1

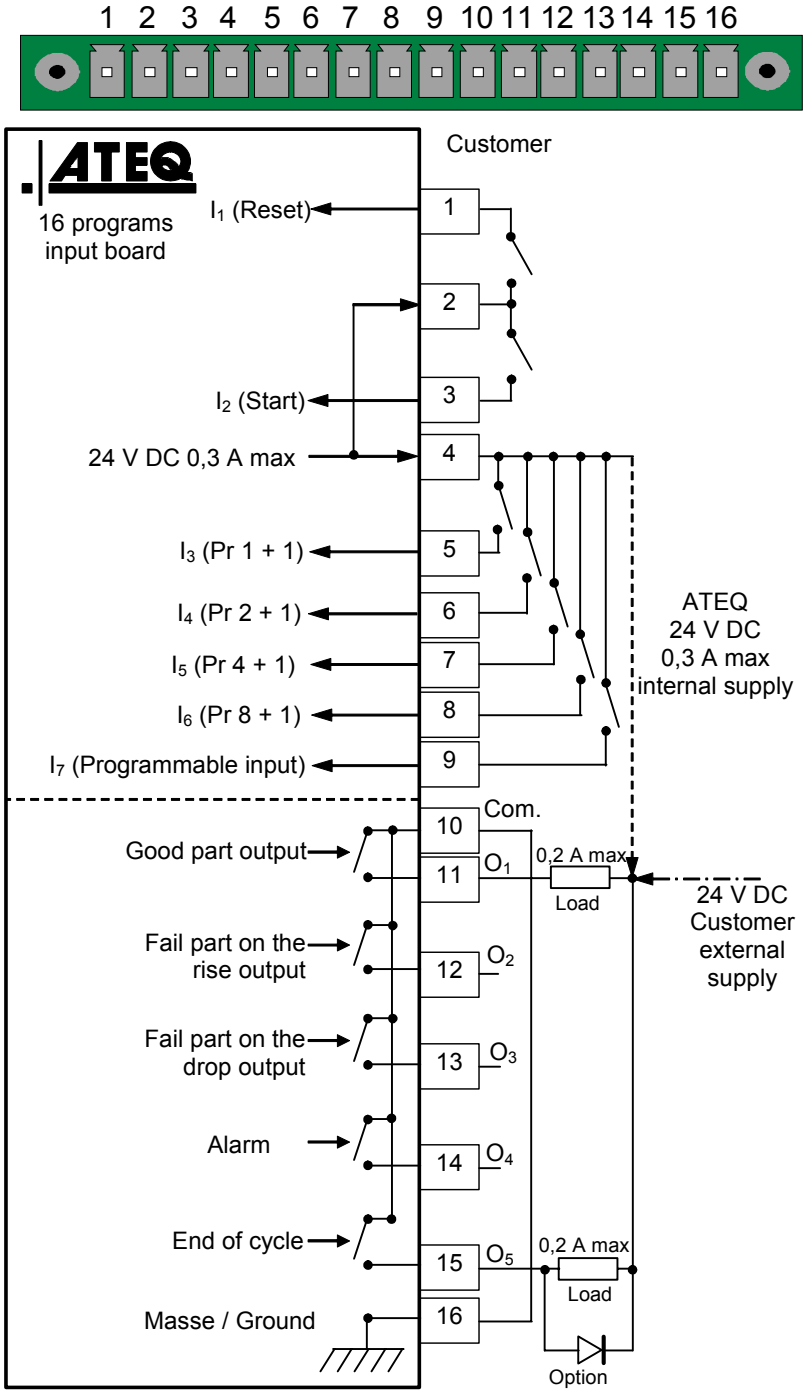
2.2.1. 5) J3 Connector (I/O Inputs/Outputs)programmable input

Input 7 can be parameterised in the **CONFIGURATION/ INPUT OUPUT** menu.

- ✓ Program selection
- ✓ Auto zero reset request,

Some possibilities only appear if the function is used.

2.2.1. 6) J3 connector (AON Inputs/Outputs) diagram



***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

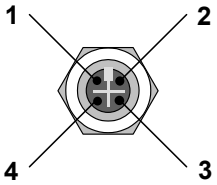
2.2.1. 7) J4 connector

Allows the connection of the power supply.

The power supply must be of 24V DC.

The instrument can have its power supplied directly on the relay board J3 connector on one of the 24 V DC pins.

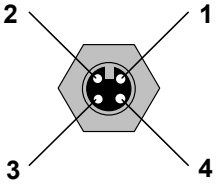
2.2.1. 8) J5 connector (remote control)



Allows the connection of an intelligent remote control. (Female Lumberg connector).

PIN 1	Network
PIN 2	Power supply + 24V
PIN 3	Network
PIN 4	Ground 0V

2.2.1. 9) J6 Input Connector (RS485)



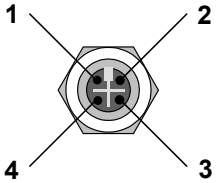
Reserved for **ATEQ** network

Used for communication with other **ATEQ** instruments.

(Lumberg male connector).

PIN 1	Network (D+)
PIN 2	+ 24V Power supply
PIN 3	Network (D-)
PIN 4	0V Earth

2.2.1. 10) J7 Output connector (RS485)



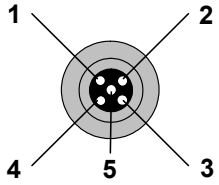
Reserved for **ATEQ** network

Used for communication with other **ATEQ** instruments.

(Lumberg female connector).

PIN 1	Network (D+)
PIN 2	+ 24V Power supply
PIN 3	Network (D-)
PIN 4	0V Earth

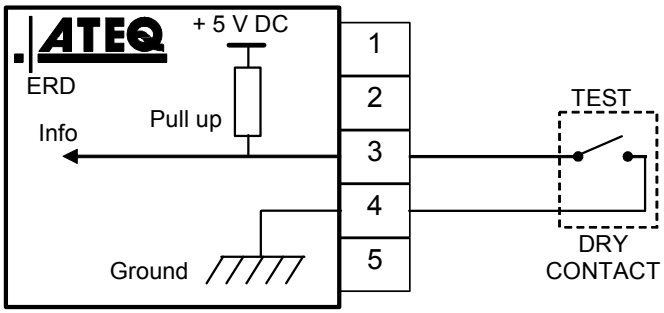
2.2.1. 11) Event contact (option)



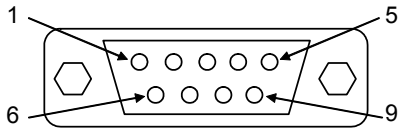
This connector allows plugging the "contact" event which will be controlled during the rise and drop phases.

(BINDER series 712 female base connector).

Pin 1	Not used	Pin 4	Contact
Pin 2	Not used	Pin 5	Not used
Pin 3	Contact		



2.2.1. 12) J8 connector (RS232)

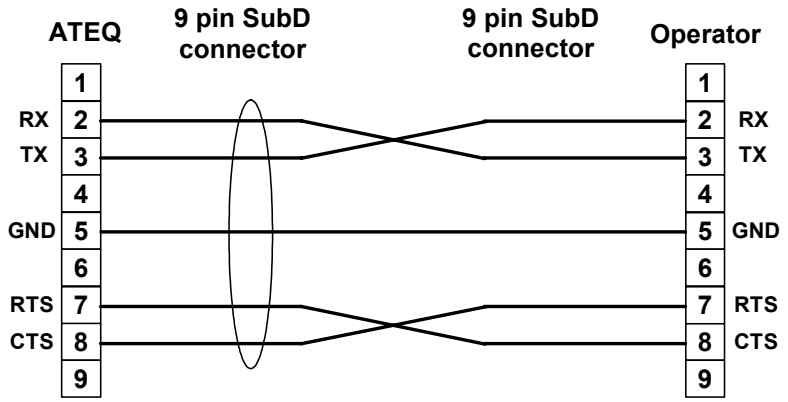


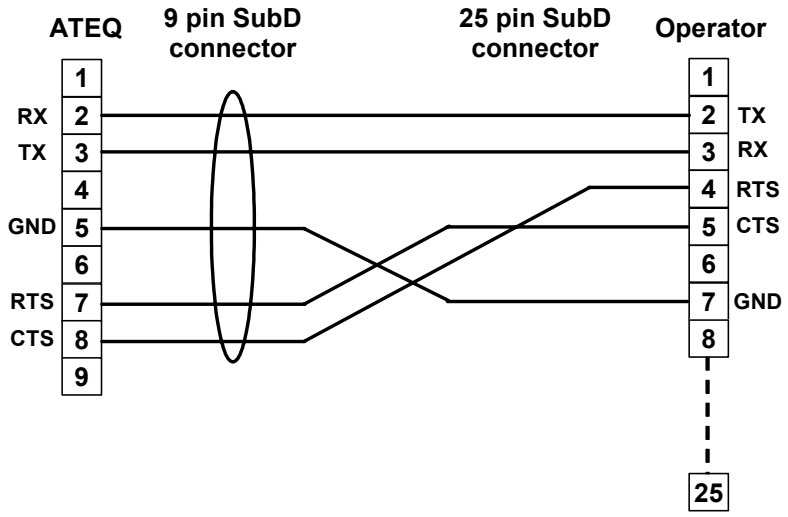
Reserved for an internal use.

9 points SubD male base.

PIN 1	Not used
PIN 2	RXD Reception of the data
PIN 3	TXD Sending of the data
PIN 4	Not used
PIN 5	Ground
PIN 6	5 V output do not use
PIN 7	RTS request to send
PIN 8	CTS clear to send
PIN 9	Not used

2.2.1. 13) Examples of RS232 cables





2.2.2. Pneumatic control connectors

2.2.2. 1) Automatic connector A

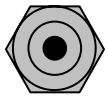
Allows the automatic management of a seal.

2.2.2. 2) Automatic connector B

Allows the automatic management of a second seal.

2.2.3. Measurement pneumatic connectors

2.2.3. 1) Regulated pressure output

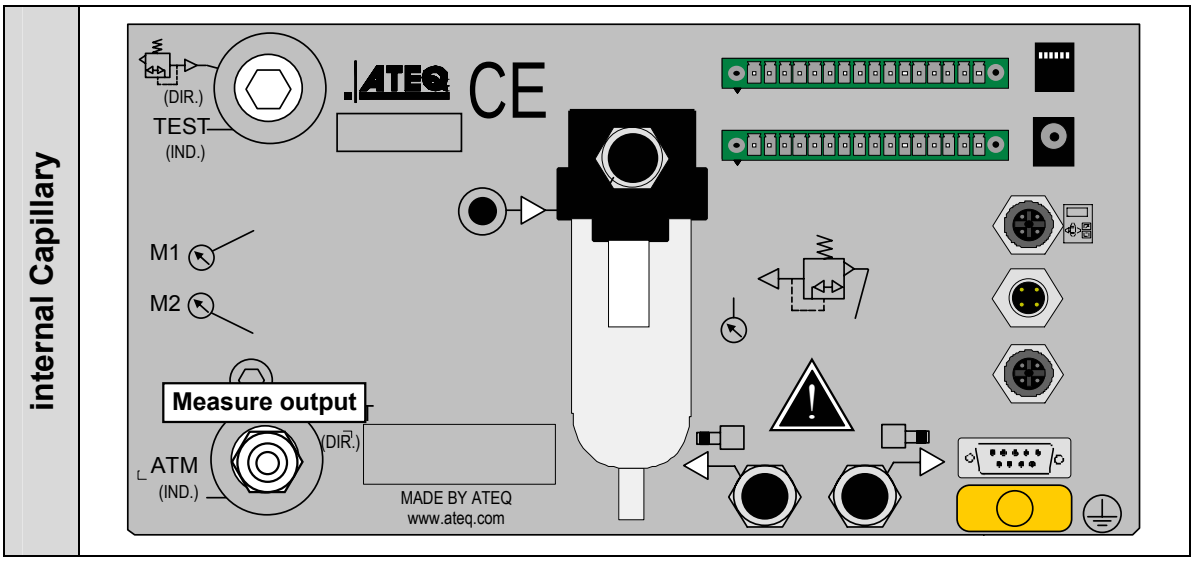


Allows the connection to the capillary (direct) or the part (indirect).

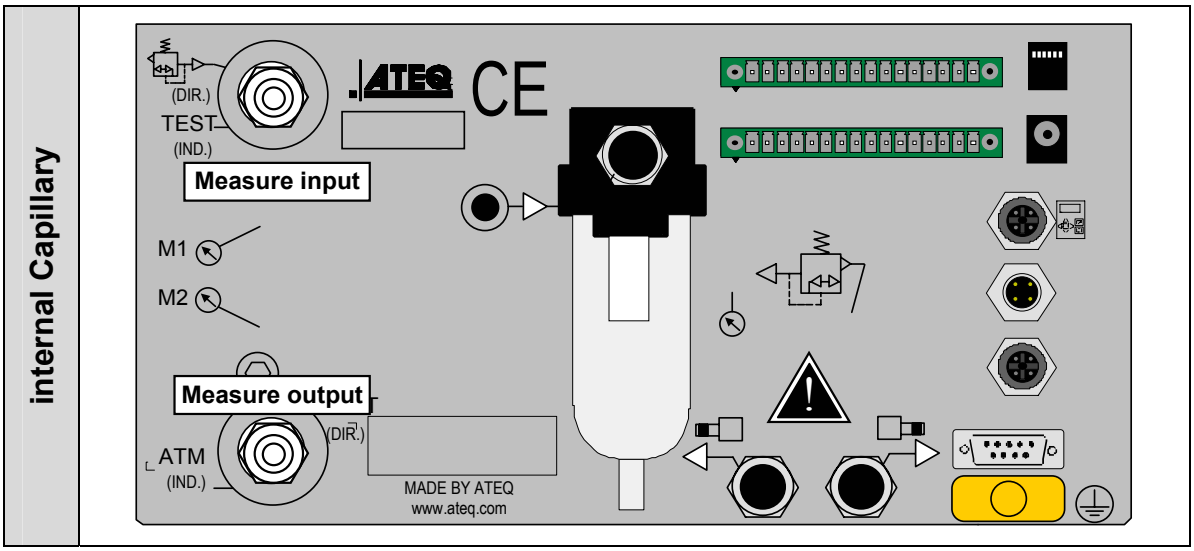
2.2.3. 2) Pneumatic Inputs / outputs

These outputs allow the connection to the capillary.

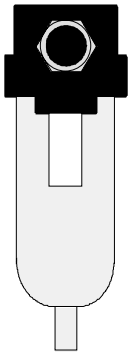
a) Direct measurement



b) Indirect Measurement



2.2.3. 3) Pneumatic air supply

	The air supply is connected to the filter found on the back of the instrument.

The air supply must absolutely be clean and dry. The presence of dusts, oil or impurities, causes a risk of improper operation of the instrument despite the filter supplied.

When the instrument operates in vacuum the entry of debris into the instrument must be avoided. For this purpose it is highly recommended that an appropriate leak proof filter is fitted between the test part and the instrument. This filter can be supplied by **ATEQ**.

The presence of impurities, oil or humidity in the air may cause a deterioration for which the guarantee will not be valid.

According to the ISO 8573-1 norm concerning the quality levels of compressed air for measurement instruments in industrial environments:

ATEQ recommends:

- Grain size and concentration CLASS 1 (0,1 µm and 0,1 mg/m^3)
- Dew point under pressure CLASS 2 (- 40° of dew)
- Maximal concentration in oil CLASS 1 (0,01 mg/m^3)

ATEQ recommends the installation:

- Of an air drier allowing the obtaining of a dry air with a dew point at less than -40°,
- Of a 25 microns and 1/100 of a micron double filter.

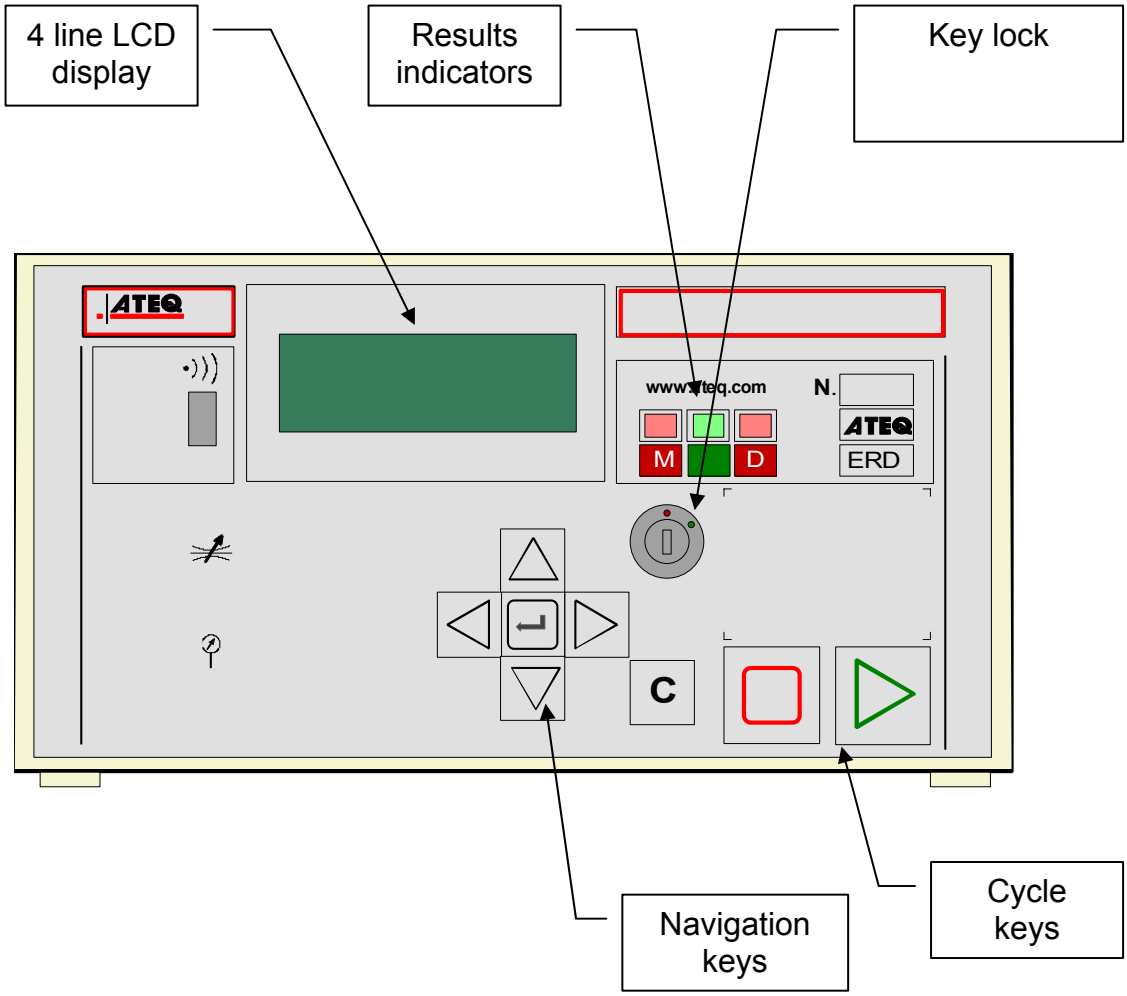
Optimisation of the operation:

The air supply pressure must be between 400 kPa and 800 kPa (4 and 8 bar) to ensure a perfect operation of the pneumatic distributors.

With the electronic regulator, it is necessary that the input pressure of the regulator be superior by at least 10 % of the full scale of the electronic regulator.

Chapter 2
OPERATOR INTERFACES

1. PRESENTATION OF THE FRONT PANEL OF THE ERD 520

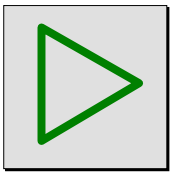
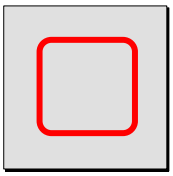


2. PRESENTATION OF THE KEYBOARD KEYS

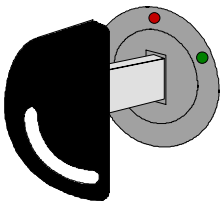
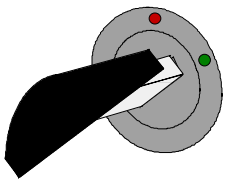
2.1. NAVIGATION KEYS

KEY	FUNCTION
△	Move up or increase of the numerical values
▽	Move down or decrease of the numerical values
◁	Not used
▷	Not used
↵	**ENTER** key Enter the Parameter edition menu Validation of a parameter
C	« **C** » for **CANCEL** Return to the previous menu or function Escape a parameter without modifying it

2.2. CYCLE KEYS

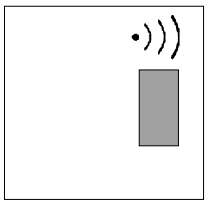
KEY	FUNCTION
	**START** key Launching a measurement cycle
	**Reset** key (Reset to 0) Stopping of the measurement cycle in progress

3. KEY LOCK

POSITION	FUNCTION
	**LOCK** position**.** The access to the adjustable parameters is not possible.
	**ACCESS** position. Access to the adjustable parameters.

Note: whatever the position of the key-lock is (**LOCKED** or **ACCESS**), it is possible to start and stop test cycles.

4. INFRA-RED INTERFACE



Not used.

5. 4 LINE LCD DISPLAY

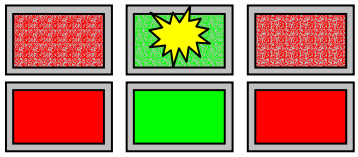
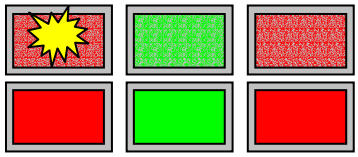
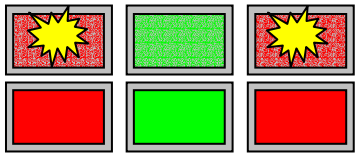
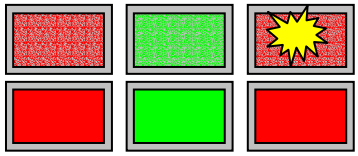
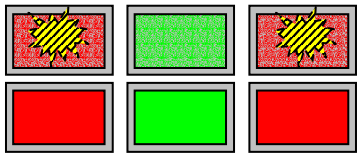
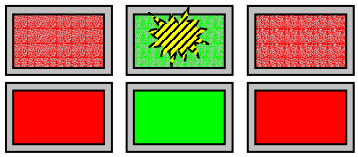
```
     ATEQ ERD5
  Version XX.XXi
   0->500 mbar
Flow F.Sc. 30.00 l/h
```

Allows the display of the measurements and adjustable parameters. In the example to the left, XX.XXi represents the program version of the instrument.

6. FUNCTIONALITY OF THE INDICATORS

The  symbol represents a permanently lit indicator.

The  symbol represents a flashing indicator.

Good part indicator	
Rise (pressure up) event error indicator	
Step (steady pressure) event error indicator	
Drop (pressure down) event error indicator	
Red lights flashing, alarm fault.	
Stand-by (intermittent flashing)	

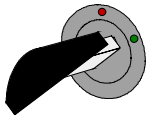
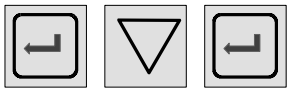
Note: *The rise and drop errors have priority over the step error.*

Chapter 3
STARTUP AND ADJUSTMENTS

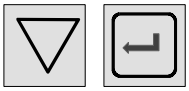
1. POWERING UP THE ATEQ ERD 520

Supply the instrument with 24 DC. When switched on the instrument:		
- Displays the version and the sensor full scales …		ATEQ ERD5 Version XX.XXi 0->500 mbar Flow F Sc.: 30 l/h
Proceeds to carry out an **AUTO ZERO**…		RUN/Pr :001 PRESS = 400.0 mbar 0-> 500 mbar AUTOZERO
…then displays the main menu.		RUN/Pr:001 PRESS = 400.0 mbar READY

2. CREATION OF A TEST PROGRAM

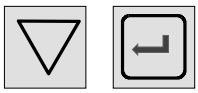
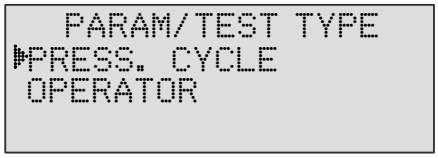
To be able to modify the parameters, place the key in the **ACCESS** position.		RUN/Pr:001 PRESS = 400.0 mbar READY
To access the main menu, press on the **ENTER** key. From the main menu, place the cursor in front of the **PARAMETRES** menu. Confirm with the **ENTER** key.		MAIN MENU RUN PROG. : --- ▶PARAMETERS SPE CYCLE: Disabled
The **PARAMETERS** menu allows the management of test programs. ☞If the different programs to be created have different parameters, it is necessary to create them one by one. ☞If these programs have identical parameters, a base program can be created and the Copy – Paste function used to duplicate this program as many times as necessary.		PARAMETERS ▶Copy-Paste Pr :001 ---------- Pr :002 ----------

2.1. CHOICE OF THE PROGRAM NUMBER

Position the cursor in front of the chosen program number. Confirm with the **ENTER** key.		PARAMETERS Copy-Paste ▶Pr :001 ---------- Pr :002 ----------

2.2. SELECTION OF THE TEST TYPE

Two test types are available.

The **PARAMETRES** menu gives access to two possible test types: Pressure test (**PRESS. CYCLE**) and an operator test (**OPERATOR**) non functional; refer to the following paragraph for explanations. Place the cursor in front of the required test type and confirm with the **ENTER** key.		

2.2.1. Pressure cycle mode test

The Pressure cycle mode test allows the detection of flow events during a pressure rise and/or drop. This test also allows the control of flow during a pressure step.

☞Calibration can not be used in this mode.

2.2.2. Operator mode test

This test type allows the operator to carry out actions (or checks) on the part undergoing a test then to confirm it with the **"START"**  key if he considers that the test is good, or on the **"RESET"**  key if he considers that his test is bad.

2.3. ADJUSTMENT OF THE PARAMETERS

Once the test type is chosen, the cycle parameters must be adjusted.

The procedure to follow to adjust all the test parameters is identical. Example with the Wait time A.

First, place the cursor in front of the chosen parameter with the navigation keys (here, wait time A).	△ ▽	PARAM/Pr001 TEST : PRESS. CYCLE ▶COUPL. A : 00.0 s INIT.PRES : 0000
Next, confirm with the **ENTER** key. The cursor moves to the right hand side of the screen.	↵	PARAM/Pr001 TEST : PRESS. CYCLE COUPL. A : 00.0 s ◀ INIT.PRES: 0000
Modify the value with the navigation keys.	△ ▽	PARAM/Pr001 TEST : PRESS. CYCLE COUPL. A : 00.5 s ◀ INIT.PRES: 0000
Once the value is modified, confirm with the **ENTER** key.	↵	PARAM/pr001 TEST : PRESS. CYCLE ▶COUPL. A : 04.0 s INIT.PRES: 0000
To move to the next parameter, use the navigation keys.	△ ▽	PARAM/pr001 TEST : PRESS. CYCLE COUPL. A : 04.0 s ▶INIT.PRES: 0000
To exit the menu, use the **CANCEL** key.	**C**	PARAMETERS Copy-Paste Pr:001 PRESS. CYCLE ▶Pr:002 PRESS. CYCLE

2.3.1. Pressure units

This parameter represents the pressure unit for the whole Cycle. The different units are: Pa, kPa, MPa, mbar, bar, PSI.

2.3.2. Reject unit

The flow units are the following: l/h, l/min, m^3/h, ml/min, ml/s.

2.3.3. Coupling time

The coupling (also known as wait) times A and B are cycle start parameters.

When there is no automatic connector, the coupling time A is a part of the cycle.

In the event of an instrument with automatic connector the coupling time A allows the activation of a first connector as soon as the cycle starts and to delay the pressurisation of the test part. The coupling time B allows the activation of a second automatic connector. These coupling times ensure a better stabilisation of the seals placed on the test part.

2.3.4. Initial (start) pressure

This parameter represents the initial pressure at the start of the cycle.

2.3.5. Pressure UP (rise) time

This time is the time taken for the pressure to rise from the initial pressure to the instruction step pressure.

2.3.6. Step pressure

The step pressure corresponds to the instruction pressure which is maintained during the step.

2.3.7. Step minimum pressure

This parameter is the minimum monitored threshold of the step pressure.

2.3.8. Step maximum pressure

This parameter is the maximum monitored threshold of the step pressure.

2.3.9. Step time

The step time is the time during which the step pressure is maintained.

2.3.10. End pressure

This parameter represents the final pressure at the end of the cycle.

2.3.11. Pressure down (drop) time

This time corresponds to the time taken for the pressure to drop from the instruction step pressure to the instruction final pressure.

2.3.12. Functions

The **FUNCTION** menu gives access to additional parameters which must first be activated from the **CONFIGURATION** menu then the **EXTENDED MENUS**.

If no additional parameter has been activated in the **EXTENDED MENUS**, the **FUNCTION** menu is simply empty.

For activating these parameters, refer to chapter 4 § 2.

2.3.13. Events control

These parameters when they're validate by "**Yes**" in the "**FUNCTIONS**" menu appears in the principal test program parameters list.

These measurements are controlling events who must arrived during the test cycle, contact during the rising ramp and dropping ramp or flow measurements during the tree cycle phases (rise, drop and step).

The contacts and the flow are independent. However the maximum and minimum pressure values are the same for each event.

2.3.13. 1) Rising test contact

a) Maximum pressure on the rise

This is the superior pressure limit for the contact test during the rise.

b) Minimum pressure on the rise

This is the inferior pressure limit for the contact test during the rise.

c) Contact

Contact type parameter to have between the inferior and superior pressure limits during the rise, open or close.

2.3.13. 2) Dropping test contact

a) Maximum pressure on the drop

This is the superior pressure limit for the contact test during the drop.

b) Minimum pressure on the drop

This is the inferior pressure limit for the contact test during the drop.

c) Contact

Contact type parameter to have between the inferior and superior pressure limits during the drop, open or close.

2.3.13. 3) Flow control during the rise

This allows the flow control during the rise.

a) Maximum pressure on the rise

This is the superior pressure limit for the flow test during the rise.

b) Minimum pressure on the rise

This is the inferior pressure limit for the flow test during the rise.

c) Minimum flow

This is the minimum flow value to have between the inferior and superior pressure limits during the rise.

2.3.13. 4) Step flow

Flow control during the step phase.

a) Maximum flow

This is the maximum flow value during the step phase.

b) Minimum flow

This is the minimum flow value during the step phase.

2.3.13. 5) Flow control during the drop

This allows the flow control during the drop.

a) Maximum pressure on the drop

This is the superior pressure limit for the flow test during the drop.

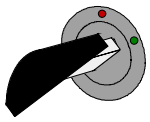
b) Minimum pressure on the drop

This is the inferior pressure limit for the flow test during the drop.

c) Maximum flow

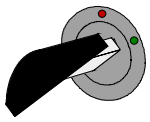
This is the maximum flow value to have between the inferior and superior pressure limits during the rise.

3. COPYING OF A TEST PROGRAM

To be able to modify the parameters, place the key in the **ACCESS** position.		
From the main menu, place the cursor in front of the **PARAMETERS** heading.	△ ▽	MAIN MENU RUN PROG. : 001 ▶PARAMETERS SPE CYCLE: Disabled
Validate with the **ENTER** key. The cursor will place itself in front of the Copy-Paste function. Confirm this function again with the **ENTER** key.	↵ ↵	PARAMETERS ▶Copy-Paste Pr :001 VALVE 1 Pr :002 VALVE 2
Next, validate the **COPY** function**.**	↵	PARAM/Copy-Paste ▶COPY :Pr --- PASTE :Pr ---
Display the number of the program to be copied by using the navigation arrows. (Here, program n°1).	△ ▽	PARAM/Copy-Paste COPY :Pr 001 ◀ PASTE :Pr ---
Confirm with the **ENTER** key.	↵	PARAM/Copy-Paste ▶COPY :Pr 001 PASTE :Pr ---
Place the cursor in front of Paste.	△ ▽	PARAM/Copy-Paste COPY :Pr 001 ▶PASTE :Pr ---
Confirm with the **ENTER** key. Attribute a number to this new program by using the navigation keys (for example n°3).	↵ ▽ △	PARAM/Copy-Paste COPY :Pr 001 PASTE :Pr 003 ◀

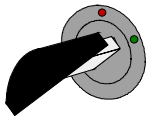
Confirm with the **ENTER** key. The display confirms the copy of the program.	↵	COPY IN PROGRESS...
From this moment, the parameters for program 1 are duplicated into program 3. In this example, program n°3 is therefore an exact copy of program n°1.		PARAM/Copy-Paste COPY : Pr 001 ▶PASTE : Pr 003
Press twice on **CANCEL** to return to the main menu.	**C** **C**	MAIN MENU RUN PROG : 001 ▶PARAMETERS SPE CYCLE : Disabled

4. DELETING A PROGRAM OR THE NAME OF A PROGRAM

To be able to modify the parameters, turn the key to the **ACCESS** position.		
Position the cursor in front of **PARAMETERS**. Confirm with the **ENTER** key.	▽ ↵	MAIN MENU RUN PROG. : 001 ▶PARAMETERS SPE CYCLE: Disabled
Place the cursor in front of the program number to be deleted or the name of the program to be deleted.	▽	PARAMETERS Copy-Paste ▶Pr:001 VALVE 1 Pr:002 VALVE 2
Confirm a first time to enter the program.	↵	PARAM/Pr001 ▶TEST : PRESS. CYCLE COUPL. A : 00.0 s INIT.PRES: 0000
Confirm a second time to gain access to the delete menu. Two possibilities are available: delete the name of the program or delete the whole program.	↵	M/Pr001/TEST TYPE ▶Delete name Delete program
1°) Confirm a third time. The name of the program is deleted.	↵	PARAMETERS ▶Copy-Paste Pr:001 ---------- Pr:002 VALVE 2
2°) Place the cursor in front of delete program.	▽	M/Pr001/TEST TYPE ▶Delete name Delete program
Confirm with **ENTER**. The program is deleted.	↵	PARAM/Pr001 ▶TEST : PRESS. CYCLE COUPL. A : 00.0 s INIT.PRES: 0000

5. LAUNCHING OF A CYCLE

5.1. CHOICE OF THE PROGRAM NUMBER TO BE LAUNCHED

Place the key in the **ACCESS** position.		
From the main menu, place the cursor in front of the **RUN PROG.** heading.	△ ▽	MAIN MENU ▶RUN PROG. : 001 PARAMETERS SPE CYCLE: Disabled
Confirm with the **ENTER** key.	↵	MAIN MENU ▶RUN PROG. : 001 PARAMETERS SPE CYCLE: Disabled
Display the number of the program required by scrolling through the number with the navigation keys.	△ ▽	MAIN MENU RUN PROG. : 004 ◀ PARAMETERS SPE CYCLE: Disabled
Confirm with the **ENTER** key.	↵	MAIN MENU ▶RUN PROG. : 004 PARAMETERS SPE CYCLE: Disabled

5.2. LAUNCHING OF THE MEASUREMENT CYCLE

Press on the **START** key to launch the measurement cycle.	▷	CYCLE/Pr: 004 PRESS =0.500 bar READY

The cycle comprises three phases.

5.2.1. Rise (pressure up)

		CYCLE/Pr:001 PRESS =0.300 bar FLOW =0 l/h PRESSURE UP

As soon as the event takes place

Real pressure Real flow Fixed event pressure		CYCLE/Pr:001 PRESS =0.800 bar FLOW =000 l/h OPEN =0.500 bar

5.2.2. Step

		CYCLE/Pr:001 PRESS =1.00 bar FLOW =1200 l/h OPEN =0.500 bar

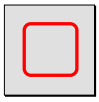
5.2.3. Drop (pressure down)

Real pressure Real flow Fixed event pressure		CYCLE/Pr:001 PRESS =0.500 bar FLOW =1200 l/h OPEN =0.500 bar
Real pressure Closing pressure Rise event pressure		CYCLE/Pr:001 PRESS =0.500 bar CLOSE =0.400 bar OPEN =0.500 bar

5.2.4. Cycle end

Opening pressure Step flow Closing pressure		CYCLE/Pr:001 PRESS =0.500 bar FLOW =1200 l/h PRESS =0.400 bar

6. STOPPING A CYCLE

Press on the **Reset** key to stop the measurement in progress. The heading « **READY** » indicates that the instrument is configured for a new measurement test.		CYCLE/Pr:004 PRESS =0.500 bar READY

Chapter 4
FUNCTIONS OF THE INSTRUMENT

1. MENU STRUCTURE

1.1. MAIN MENU

.

MAIN MENU		Sub menu 1		Sub menu 2		Sub menu 3		Sub menu 4
ACTIVE PROGRAM	>	1 to 16						
v								
PARAMETERS	>	Copy Paste	>	Copy				
v		v		Paste				
v		v						
v		Pr 01 to 16	>	PRESS. CYCLE	>	Test: press. cycle	>	Delete
v				v		v		Delete name
v				v		v		
v				v		Pressure unit		MPa > bar > mbar > PSI > Pa > kPa >
v				v		v		
v				v		Reject unit	>	l/h > l/min > m^3/h ml/min > ml/s >
v				v		Coupling A		
v				v		Initial pressure		
v				v		Rise time		
v				v		Minimum rise pressure*		
v				v		Maximum rise pressure*		
v				v		Minimum flow rise flow		
v				v		Contact	>	Close
v				v		v		Open
v				v		v		
v				v		STEP FLOW	>	Step minimum flow
v				v		v		Step maximum flow
v				v		v		
v				v		Minimum step pressure		
v				v		Maximum step pressure		
v				v		Step (time)		
v				v		Minimum flow step flow		
v				v		Maximum flow step flow		
v				v		End pressure		
v				v		Drop (time)		

v		v	Minimum pressure drop*			
v		v	Maximum pressure drop*			
v		v	Maximum flow drop flow			
v		v	Contact	>	Close	
v		v	v		Open	
v		v	v			
v		v	Functions	>	See note	
v		v				
v		OPERATOR	>	Type: operator	>	Delete name
v				Coupling time A		Reset program
v				Test time		
v				Functions	>	Refer to note
v						
SPECIAL CYCLES	>	Disabled				
v		Infinite fill				
v		Piezo Auto zero				
v						
CONFIGURATION	>	EXTENDED MENUS	>	Name		
v		v		Cycling		
v		v		Units		
v		v		Filter		
v		v		Pressure correction		
v		v		Offset		
v		v		Automatic connector		
v		v		Valves codes		
v		v		Auxiliary outputs		
v		v		Stamping		
v		v		Mini-valve		
v		v		Start pressure		
v		v				
v		Electronic regulator learning	>	Frequency (minutes)		
v		v		Number of cycle		
v		v				
v		HOUR	>	Hour		
v		v		Minute		
v		v		Day		
v		v		Month		
v		v		Year		
v		v				
v		RS232	>	C540/F580	Print frame	> Pressure
v		v		v		Program name
v		v		v		Date & time

v	v	v				Lines before
v	v	v				Lines after
v	v	v				Inter line
v	v	v				Form feed
v	v	v				
v	v	Printer	>	RS parameters	>	Speed: 4800 > 9600 > 19200 > 28800 > 38400 > 57600 > 115200
v	v	v		v		Serial port: 1st-7bit-="0" > 1st-7bit-="1" > 1st-7bit-even > 1st-7bit-odd > 1st-8bit-none > 1st-8bit-="0" > 1st-8bit-="1" > 1st-8bit-even > 1st-8bit-odd >
v	v	v		v		
v	v	v		Print frame	>	Pressure
v	v	v		v		Program name
v	v	v		v		Date & time
v	v	v		v		Lines before
v	v	v		v		Lines after
v	v	v		v		Inter line
v	v	v		v		Form feed
v	v	v		v		
v	v	v		Send conditions	>	All results
v	v	v		v		Pass
v	v	v		v		Test fail
v	v	v		v		Reference fail
v	v	v		v		Alarm
v	v	v		v		Pressure out
v	v	v		v		Re-workable
v	v	v		v		Calibration
v	v	v		v		
v	v	v		Export	>	yes / no
v	v	v		v		
v	v	v		Print parameters		
v	v	v				
v	v	v				
v	v	Modbus	>	Address	>	255 (fixed)
v	v			v		
v	v			RS parameters	>	Speed: 4800 > 9600 > 19200 > 28800 > 38400 > 57600 > 115200

				Serial port: 1st-7bit-="0" > 1st-7bit-="1" > 1st-7bit-even > 1st-7bit-odd > 1st-8bit-none > 1st-8bit-="0" > 1st-8bit-="1" > 1st-8bit-even > 1st-8bit-odd >
v	v			
v	v			
v	RS485	>	C540/F580	
v	v			
v	SECURITY	>	yes / no	
v	v			
v	Light	>	Mode	> Continuous
v	v		v	Manual
v	v		v	Automatic
v	v		v	
v	v		Intensity	> 0 % to 100 %
v	v			
v	I/O group		1 to 2	
v	v			
v	Change I/O	>	Input 7	> Program selection
v	v		v	Infinite fill
v	v		v	Piezo auto zero
v	v		v	
v	24 V DC outputs		External 1 to X	En cycle
v				Permanent
v				
SERVICE	> PARAMETERS	>	Save	
v	v		Recover	
v	v		Delete	
v	v			
RESULTS	> PROGRAM			
v	v			
v	STATISTIQUES	>	Program n°	
v	v		Total	
v	v		Part OK	
v	v		Part bad drop flow	
v	v		Part bad step flow	
v	v		Part bad rise flow	
v	v		Pressure fault	
v	v		Alarm	
v	RESET			
v	PRINT			
v				
LANGUAGE	> ENGLISH			
v	FRENCH			
v				

STAND-BY	>	Now		
		v		
		Poser-on time	>	Hour
		v		Minute
		v		
		Power-off time	>	Hour
				Minute
				Delay

***Note**: The parameters which figure in the **EXTENDED MENUS** can be found in the **FUNCTIONS** menu of the program when they are activated.*

1.2. "FUNCTIONS" MENU WHEN ACTIVATED

MAIN MENU		Sub menu 1		Sub menu 2		Sub menu 3	Sub menu 4
FONCTION	>	OPEN CT	>	OP. PMAX			
		v		OP. PMIN			
		v		CONTACT	>	OPEN	
		v				CLOSED	
		CLOSE CT	>	CL. PMAX			
		v		CL. PMIN			
		v		CONTACT	>	OPEN	
		v				CLOSED	
		OPEN TEST	>	OP. PMAX			
		v		OP. PMIN			
		v		OP. MIN FL			
		v		FLOW UNIT			
		v					
		STEP FLOW	>	S. MAX FLW			
		v		S. MIN FLW			
		v					
		CLOSE TEST	>	CL. PMAX			
		v		CL. PMIN			
		v		CL. MAX F.			
		v		FLOW UNIT			
		NAME					
		v					
		CYCLING		Inter cycle			
		v		All			
		v		Good part			
		v		Fail part drop flow			
		v		Fail part step flow			
		v		Fail part rise flow			
		v		Warning			
		v		Pressure error			
		v					
		Units	>	Units	>	SI	
		v		v		USA	

v	Flow unit	>	SI	>	l/h > ml/s > ml/min > m^3/h > l/min >
v			USA	>	in^3/h > in^3/min > in^3/s > ft^3/h
Automatic connector	>	Coupling time A			
v		Coupling time B			
v					
Valve codes	>	External 1			
v		External 2			
v		External 3			
v		External 4			
v		External 5			
v		External 6			
v		Internal 1			
v		Internal 2			
v					
24 V outputs	>	Auxiliary 1			
v		Auxiliary 2			
v		Auxiliary 3			
v		Auxiliary 4			
v					
Short cycle	>	Yes / No			
v					
Filter					
v					
Stamping	>	Maintain			
v		All			
v		Good part			
v		Fail part maximum flow			
v		Fail part minimum flow			
v		Warning			
v		Pressure fault			
v					
Mini valve	>	Differential auto zero			
v					
Cycle end	>	Automatic reset			
v					
Offset					
v					
Pressure correction					
v					
Start pressure					

2. CONFIGURATION MENU

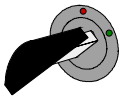
2.1. EXTENDED MENUS

The extended menus give access to additional functions. If these functions are activated, they can be found under the **FUNCTIONS** menu when a program is created. If no additional function is activated, the **FUNCTIONS** menu is empty when a new program is created.

2.1.1. Activation of the additional functions

In the main menu, place the cursor in front of the **CONFIGURATION** label.	↵	MAIN MENU SPE CYCLE: Inactive ▶CONFIGURATION RESULTS
Confirm using the **ENTER** key.	↵	CONFIGURATION ▶EXTENDED MENUS HOUR SECURITY : No
Next, confirm the **EXTENDED MENUS** function with the **ENTER** key. The list of additional functions is displayed.	↵	CONFI/EXTENDED MENU ▶NAME : No CYCLING : No AUTO CONNECT : No
To activate a function (e.g. the **NAME** function), validate it with the **ENTER** key. Next, choose **YES** with the navigation keys then confirm again with the **ENTER** key. Restart the operation if necessary to activate other functions.	↵ △ ▽ ↵	CONFI/EXTENDED MENU ▶NAME : Yes CYCLING : No AUTO CONNECT : No
Once all the chosen functions have been activated, press twice on the **CANCEL** key to return to the main menu.	C C	MAIN MENU SPE CYCLE: Disabled ▶CONFIGURATION RESULTS

2.1.2. Adjustment of the additional functions

✓ Place the key in the **ACCESS**  position.

✓ Create a new program (refer to chapter 3 §2 "Creation of a test program").

✓ In the parameters list of this new program, validate the **FUNCTIONS** parameter (refer to chapter 3 § 2.3 "Adjustment of the parameters").

⚠ **Only the functions activated according to the method described in the previous paragraph will appear in the FUNCTIONS parameter.**

2.1.3. List of additional functions

2.1.3. 1) Name

This function allows the personalisation of a program, for example to identify it by the name of the test part.

☞Select the option and adjust settings if necessary.

2.1.3. 2) Program sequencing

This function enables several tests to be carried out by the instrument one after the other. The instrument offers 8 program sequencing criteria.

The sequencing order can be edited; the choice of the following program is defined in the parameters. By default the programs are sequenced according to their original number P+1.

When an active program is sequenced with another program, a "+" is displayed behind the program number.

```
      MAIN MENU
▶RUN PROG.     : 01+
 PARAMETERS
 SPE CYCLE : none
```

Associated parameters to be set: NEXT PROGRAM, INTER-CYCLE (wait or coupling time between two cycles). The chaining conditions are: ALL (under all conditions), part good, rise error, drop error, warning, pressure error.

☞Select the option and enter settings if necessary.

2.1.3. 3) Units

This function allows the operator to choose the units system required: SI, international metric unit system, USA, Anglo-Saxon international units system (inches, feet) and CAL, the operator personalised unit system (this system requires the carrying out of a learning cycle.

☞ Select the option and adjust settings if necessary.

2.1.3. 4) Automatic connector

The automatic connector is a pneumatic control enabling the driving of an external logic (pneumatic sealing connector). This command is activated as soon as the cycle is started and is released at the end of the cycle (refer to § 2.1.3.14) "Cycle end").

Associated parameters to be adjusted: COUPLING A, COUPLING B.

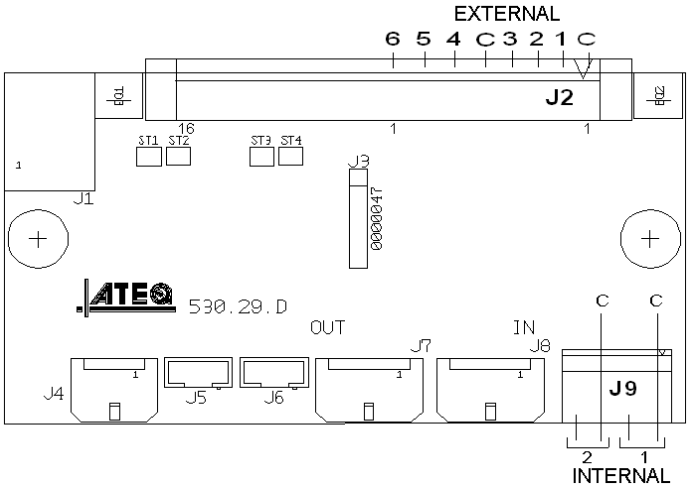
☞Select the option and adjust settings if necessary.

2.1.3. 5) Valve codes

The instrument has 8 electrical programmable outputs (24V DC / 100 mA maximum) of which 4 may be reserved through the presence of the stamping (valve code 1 internal and external) and external dump (valve code 2 internal and external).

These outputs (one or more) may be assigned to program numbers. They are generally used to select the valves in a sequence of cycles. The desired outputs can be activated for each program (see Chapter 1 paragraph 2.2.1.1.).

Associated parameters to be set: External 1, External 2, External 3, External 4, External 5, External 6, Internal 1, Internal 2.



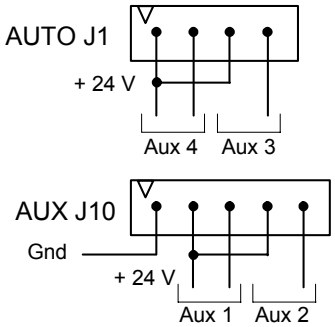
☞ Select the option and adjust settings if necessary.

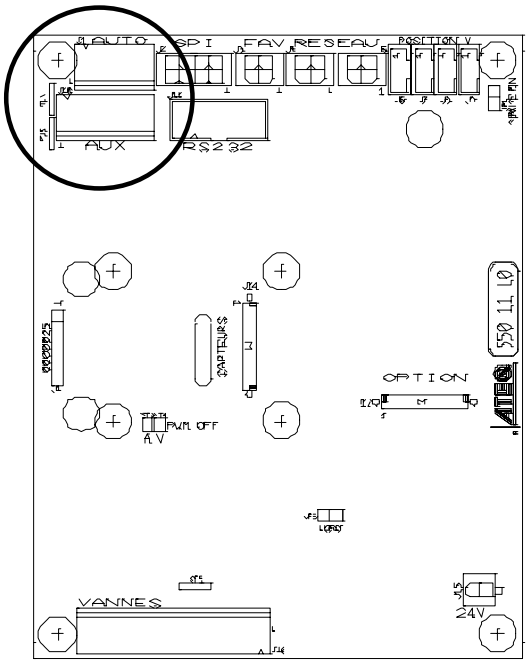
2.1.3. 6) 24V Auxiliary outputs

On the instrument main board there are four programmable electrical outputs (24V DC / 100 mA maximum, outputs).

Unlike the **valve code** outputs, the **auxiliary outputs** reserved for a pneumatic function are identified by the name of the function: stamping, automatic connector, etc. When they are free and available for the operator to use they are called: auxiliary and the position number.

Associated parameters to be adjusted: Auxiliary 1, Auxiliary 2, Auxiliary 3, Auxiliary 4.





☞ Select the option and enter settings if necessary.

2.1.3. 7) Short cycle

This function allows when it's activate that not doing the test cycle completely when the instrument detects a fail part during the rise ramp.

When the part is fail during the rise ramp, the "Step" phase is not realised, the cycle goes directly to the drop ramp and does the drop time, with the pressure instruction forced to zero (part dump).

☞Select the option and adjust settings if necessary.

2.1.3. 8) Stamping function

This option is used to activate a pneumatic output which marks the part (for example using a pneumatic cylinder).

Parameters can be set for the conditions and duration of marking.

This option requires two electrical outputs:

- ✓ an internal one for the internal cabling on the pneumatic output,
- ✓ an external one for "customer" cabling

One of the pneumatic outputs on the automatic connectors is used.

The output is activated at the end of test time for the programmed hold time.

Use the following procedure to use the inking function.

First, in the **CONFIGURATION** menu, confirm the **STAMPING** function.	▽ ↵	MAIN/CONFI/EXTENDED REF. VOLUME : No VOLUME COMP. : No ▶STAMPING : Yes
In the program's **PARAMETERS/FUNCTIONS** menu, confirm the **STAMPING** function.	▽ ↵	ARAM/Pr001/FUNCTIONS ▶STAMPING : Yes REF. VOLUME : No PEAK HOLD : No
Set the inking duration value (can be set between 0 and 650 seconds).	△ ▽ ↵	Pr001/FUNCT/STAMPING ▶DURATION : 00.5 s ALL RESULTS : No PASS : Yes
Then select the inking conditions from those offered.	▽ ↵	Pr001/FUNCT/STAMPING DURATION : 00.5 s ALL RESULTS : No ▶PASS : Yes

When the instrument has this option, the internal and external valves codes 1 won't be available.

2.1.3. 9) Filter

This function enables the slowing or the acceleration of the sampling speed, by carrying out an average over the set measurement time; this will facilitate the reading of the measurement.

☞ Select the option and enter settings if necessary.

2.1.3. 10) Mini valve

This function is dedicated to applications on parts with small volumes (inferior to 10 cm^3), the instrument benefits from a time base of 0,01 s instead of 0,1 s.

The programming of the **ATEQ ERD520** mini valve is identical to the programming of the standard **ATEQ ERD520**.

Associated parameters to adjust: A-Z Diff (Differential automatic reset). This time can be reduced as long as the values are stable and repeatable.

☞Select the option and adjust settings if necessary.

2.1.3. 11) Offset

A no negligible flow offset and depending of the test volume appears during a ramp generation.

This function allows the subtraction of the value set in the parameters from the value actually measured by the instrument. Example: if the measurement of the flow is of 14 litres a minute and the value of the offset set is of 5, then the instrument will display a flow value of 9 litres per minute (9 = 14 – 5).

☞ Select the option and adjust settings if necessary.

2.1.3. 12) Pressure correction

The "pressure correction" function allows the conversion of the results by the instrument to a defined pressure instruction.

When the function is activated, the instrument recalculates the flow results depending on the instruction pressure. The measurement results will therefore no take into account pressure variations.

☞ Select the option and adjust settings if necessary.

2.1.3. 13) Start pressure

This function makes it possible not to take account of measurements as long as the parameterized pressure is not reached. Useful function when important variations of flow are generated at the beginning of slope.

☞ Select the option and adjust settings if necessary.

2.1.3. 14) Cycle end

This function allows the choosing of a different Cycle end depending on the instrument configuration (connection to a PLC…).

a) Sequencing of the relays depending on the different types of cycle end

In the aim of interfacing the **ATEQ ERD F520** with its environment (PLC, PC …), the following chronograms supply the sequencing of the electrical outputs (relay board on the J3 connector) and pneumatic (automatic connectors), depending on the front panel and J3 connector command inputs (START, RESET).

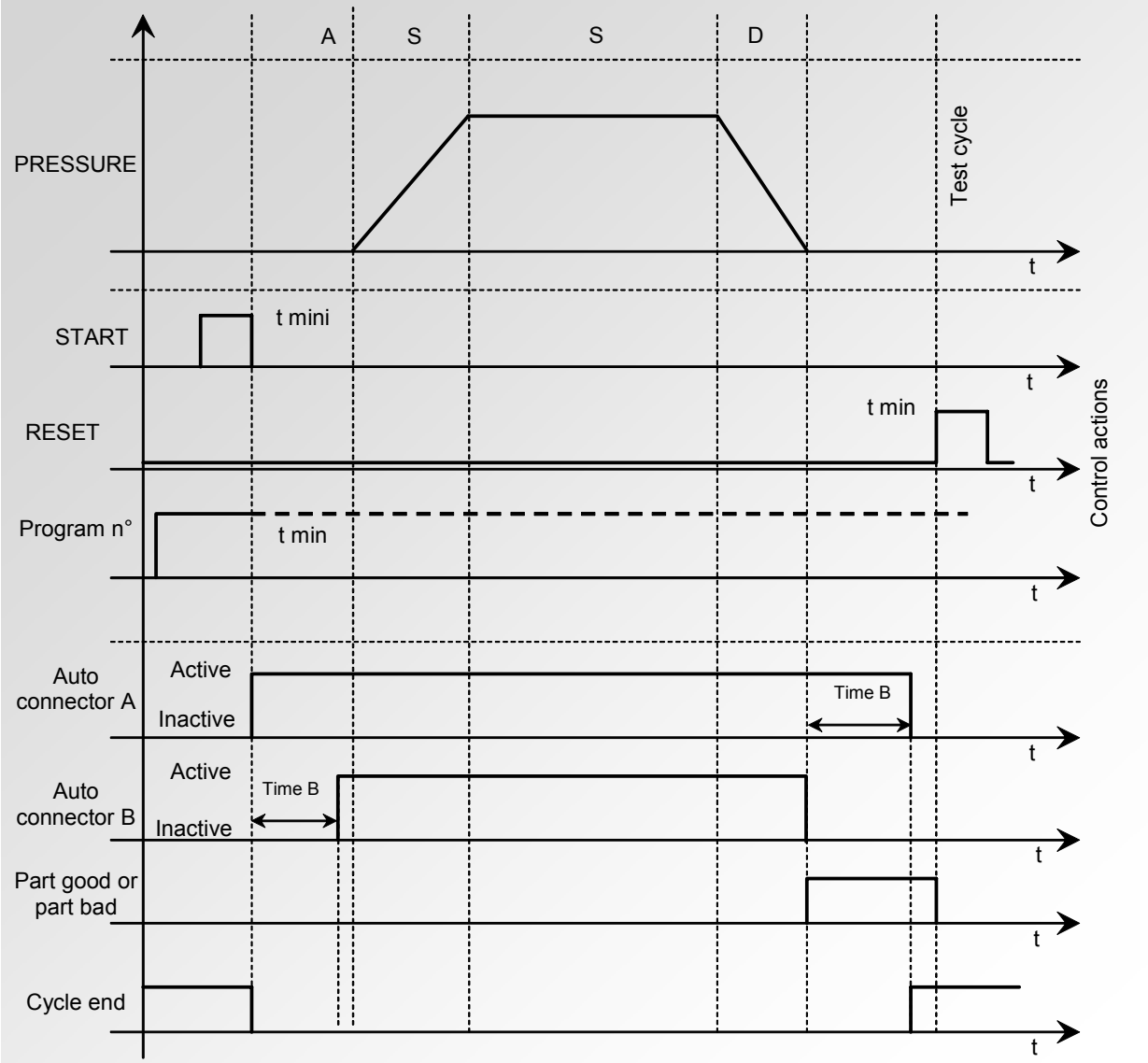
Legend	
A	Coupling time for the automatic connector A
B	Coupling time for the automatic connector B
R	Pressure rise slope
S	Pressure step
D	Pressure drop slope
START	Press on the ▷ key on the front panel or by making a contact between pins 2-3 on the J3 connector
RESET	Press on the □ key on the front panel or by making a contact between pins 1-2 on the J3 connector
Automatic connector	Active (high level): the pneumatic output is active (air exiting) Inactive (low level): the pneumatic output is inactive (absence of air)
POK or PNOK	Part OK or part Not OK Relay on the J3 connector
EoC	End of cycle relay on the J3 connector
t min	Minimum time for the reception of an input, 500 ms on the J8 connector of the central module and 50 ms on the J3 connector of a measurement unit (head).

⚠ ***The time scale is not respected, only times displayed are to be respected.***

b) End of cycle "Auto reset" (Systematic reset to naught)

If the part is good, as soon as the test time is over, the good part relay is activated up to the start of the next cycle. At the end of the cycle, the corresponding relay is activated (or after the wait time B if the value is not 0).

If the part is bad, at the end of the cycle the corresponding bad part relay is activated. The instrument is automatically emptied and sends an end of cycle signal. A new cycle can be launched.



The active program is the one selected before the initialisation. It remains active if the program entries on the connector are no longer activated. It remains active even if the program entries on the connector are no longer activated. The modification of this selection can only be done during the inter cycle.

To return to program 1, when out of cycle, supply an impulse on any of the program selection inputs.

2.2. REGULATOR LEARNING

This function is only valid in the event of the installation of a regulator in the instrument.

It enables the determining of the time between two electronic regulator learning cycles. When it is validated by "yes", the frequency (time or minutes) or the number of cycles between two learning cycles is to be determined.

When the frequency or number of cycle values are at zero, the learning request becomes manual, at the operator request by way of special cycle, or by the programmable input 7.

The learning cycle allows the calculation of the three characteristic points of the regulator (points at 20 %, 50 % and 80 % of the maximum pressure which can be supplied by the regulator, value depending on the input air supply pressure).

☞ Select the option and adjust settings if necessary.

2.3. HOUR

This function includes a clock (hours, minutes) and an internal calendar (day, month and year).

☞Select the option and adjust settings if necessary.

2.4. RS232

2.4.1. C540/580

This function enables the configuration of the instrument so that it may be supervised by an ATEQ central module.

☞ Select the option and enter settings if necessary.

2.4.2. Printer

This function enables the configuration of the instrument to enable the printing of the program data (parameters) as well as the test results. When the option is activated (YES), each time a cycle is started, the test results are systematically printed.

☞ Select the option and enter settings if necessary.

2.4.2. 1) RS parameters

These parameters enable the configuration of the instrument enabling it to communicate with the printer.

Associated parameters to be set: Speed, Stop byte, number of data bytes, parity.

☞Select the option and enter settings if necessary.

2.4.2. 2) Print frame

This function enables the configuration of the results printout.

Associated parameters to be set: PRESSURE (Display or not of the test pressure), Prog. name (Display of the program name when set), Date & Time (printing of the date and the time), Lines before (number of lines before the result), Lines after (number of lines after the result), Inter line (space between each line), Form feed (new page).

a) Frame format

The results frame is based on 4 lines and 40 columns.

- ***Example for test OK result***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
<	0	1	>	:																																			
<	0	1	>	:	R	:	O	K	:		1	9	9	.	1		m	b	a	r	:			1	1	.	3		l	/	h								
<	0	1	>	:	S	:	O	K	:		3	0	3	.	0		m	b	a	r	:				9	.	9		l	/	h								
<	0	1	>	:	D	:	O	K	:		2	2	8	.	8		m	b	a	r	:				8	.	2		l	/	h								

Frame detail:

Columns	Characters
1	<
2-3	Figure indicating program number
4	>
5	:
6	M, P ou D pour Montée, Palier ou Descente suivant la ligne (1 ligne par étape)
7	:
8 – 9	2 letters indicating OK for good part R> or R< fail part on rising S> or S< fail part on step D> or D< fail part on drop AL for Alarm
10	:
11	SPACE
12	+, - or nothing
13 - 17	5 figures indicating the leak value
18 > 21	letters indicating the unit of measurement
22	:
23	SPACE
24 - 28	5 figures indicating the flow value
29	SPACE
30 - XX	letters indicating the flow unit

- ***Example for a test result with time & date***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
<	0	1	>	:																																			
<	0	1	>	:	R	:	O	K	:		1	9	9	.	1		m	b	a	r	:			1	1	.	3		l	/	h								
<	0	1	>	:	S	:	O	K	:		3	0	3	.	0		m	b	a	r	:				9	.	9		l	/	h								
<	0	1	>	:	D	:	O	K	:		2	2	8	.	8		m	b	a	r	:				8	.	2		l	/	h								
<	0	1	>	:	2	4	/	0	9	/	2	0	0	4		1	3	:	4	3	:	3	6																

- ***Example for a result with error***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
<	0	1	>	:																																			
<	0	1	>	:	R	:	R	>	:	F	A	U	L	T																									
<	0	1	>	:	S	:	A	L	:	P	R	E	S	.		L	O	W																					
<	0	1	>	:	D	:	D	>	:	3	0	3	.	5		m	b	a	r	:				8	.	2		l	/	h									

The results frame is based on 4 lines and 40 columns.

Columns	Characters
1	<
2-3	Figure indicating program number
4	>
5	:
6 – XX	**Line 1**: program name, if exists.
6	**Line 2 to 4**: R, S or D for Rise, Step or Drop following the line (1 line by step)
7	:
8 – 9	2 letters indicating OK for good part R> or R< fail part on rising S> or S< fail part on step D> or D< fail part on drop AL for Alarm (> or < to indicate the flow inferior or superior at rejects levels)
10	:
11 – XX	Fault designation

2.4.2. 3) Sending conditions

With this function you can choose which data is to be printed on the results sheet.

Associated parameters to be set: **ALL RESULTS** (all test results), **PASS** (number of good parts), **T. FAIL** (number of bad test parts), **R. FAIL** (number of bad reference parts), **ALARM** (number of times the alarm has been triggered), **PRESS OUT** (number of times pressure was incorrect), **REWORKABLE** (number of recoverable parts), **CALIBRATION**.

☞ Select the option and enter settings if necessary.

2.4.2. 4) Export

This function can be used to create and send a special results frame which can be processed by a PC using Microsoft Excel.

This frame is of the same type as the print parameters frame except that the different character strings follow each other and are separated by a punctuation mark which enables the various boxes to be entered automatically in Microsoft Excel.

This frame is operated by connecting a computer to the instrument's RS 232 link.

☞ Select the option and enter settings if necessary.

2.4.2. 5) Print parameters

When this option is confirmed the test parameters are printed immediately.

a) Example of a parameters print frame

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
V e r s i o n   0 1 . 1 6 b
2 3 / 0 7 / 2 0 0 3
P r   0 1   P R O G R A M   N A M E
T Y P E   :   L E A K
C O U P L I N G   A   :   0 0 . 1   s
F I L L .   :   0 1 . 0   s
S T A B .   :   0 1 . 0   s
T E S T   :   0 2 . 0   s
D U M P   :   0 1 . 0   s
M a x .   F I L L .   :   2 . 4 0
M i n .   F I L L .   :   1 . 6 0
T E S T   F A I L   :   0 1 0
R E F .   F A I L   :   0 0 0
```

***Note**: The "PROGRAM NAME" characters are printed when a program name has been set in the parameters.*

2.5. RS485

This function enables the configuration of the RS485 output to a C540 central or F580 when the instrument is installed in a network.

☞ Select the option and enter settings if necessary.

2.6. MODBUS

This function enables the configuration of the Modbus link when the instrument is installed in this type of network. The frame parameters, RS parameters (speed, serial port) must be entered.

☞ Select the option and enter settings if necessary.

2.7. SECURITY

This function deactivates the **START** key on the front panel of the instrument. Tests can only be started on the inputs (J3 connector) of the instrument.

☞Select the option and adjust settings if necessary.

2.8. DISPLAY LIGHT

Screen illumination can be programmed and modified. The lighting can be adjusted according to the ambient conditions or the user's choice.

There are three lighting modes:

- ✓ **continuous** mode, display screen permanently lit whatever the conditions
- ✓ **manual** mode, the screen remains lit for 20 minutes and if the keyboard has not been used by the end of this period the screen shuts down and only relights when the keyboard is touched again.
- ✓ **automatic** mode, which is identical to manual mode, with illumination of the screen also if an action is carried out from the external inputs (rear connectors)

Using these three modes, the lighting intensity of the screen can be programmed from 00% (screen off) to 100% (maximum lighting intensity).

In the main menu, position the cursor by the **CONFIGURATION** menu then confirm by pressing **ENTER**.	▽ ↵	MAIN MENU PARAMETERS SPE CYCLE: none ▶CONFIGURATION
Move the cursor down until it is in front of the **LIGHT** menu then confirm by pressing **ENTER.**	▽ ↵	MAIN/CONFIGURATION RS485 : C540/580 SECURITY : No ▶LIGHT : No
Place the cursor in front of **MODE** to choose the required lighting mode and confirm using **ENTER.**	▽ ↵	MAIN/CONFI/LIGHT ▶MODE : AUTO INTENSITY : 50%
Select the lighting mode and confirm using **ENTER.**	▽ ↵	MAIN/CONFI/LIGHT/MO ▶CONTINUOUS MANUAL AUTO
To return to the previous menu, press the **C** button once	**C**	MAIN/CONFI/LIGHT ▶MODE : CONTINUOUS INTENSITY: 50%
To select the lighting intensity for the display, place the cursor in front of the **INTENSITY** menu and confirm using **ENTER.**	▽ ↵	MAIN/CONFI/LIGHT ▶MODE : CONTINUOUS INTENSITY : 50%
Then select the lighting intensity from 00% (off) to 100% (maximum luminosity) and the new lighting intensity will be applied as soon as **ENTER** is pressed.	▽ △ ↵	MAIN/CONFI/LIGHT MODE : CONTINUOUS ▶INTENSITY : 75%

2.9. I/O CONFIGURATION

Please refer to Chapter 1, paragraph 2.2.1.5) "Connector J3 (Binary inputs/outputs) programmable input".

2.9.1. Input 7 (IN7)

This menu is used to configure programmable input 7 on connector J3 on the 16-program input/output board.

Refer to Chapter 1, paragraph 2.2.1.5) "Connector J3 (binary Inputs/Outputs) programmable input".

The various functions which can be set on input 7 are: "Program selection", “Piezo auto zero”.

These functions represent all the special cycles available.

3. SPECIAL CYCLES MENU

3.1. SPECIAL CYCLES AVAILABLE

Depending on the validations in the extended menus or depending on the options requested before the manufacture of the instrument, the following list covers all the special cycles which can appear:

Special cycle	Function
✓ Disabled:	No special cycle is selected.
✓ Infinite fill:	Not functional.
✓ Piezo reset (auto zero):	Cycle which allows the carrying out of a forced reset to 0 of the piezo sensor and the electronic regulator.

To start a special cycle, select it in the "special cycles" menu, then confirm on the ▷.

Key. To stop it press on the □ key or in some cycles the stop is automatic.

3.2. INFINITE FILL

It is possible to carry out an infinite fill with the instrument, in other words, a permanent flow of air at the test pressure in order to locate leaks (set-up adjustment...).

From the main menu, position the cursor in front of the **CYCLE SPE** title and confirm with the **ENTER** key.	▽ ↵	MAIN MENU ACTIVE PROG. : 001 PARAMETERS ▶CYCLE SPE: Disabled
Next, place the cursor in front of **Infinite fill** and validate with the **ENTER** key.	▽ ↵	SPE CYCLE Disabled ▶Infinite fill Piezo auto zero
The display confirms that the special cycle is selected.		MENU PRINCIPAL RUN PROG. : 001 PARAMETERS ▶SPE CYCLE : Inf Fill

Press on the **START** key to start the special cycle.	▷	CYCLE/Pr:001 PRESS = 20 mbar RISE
To stop the cycle, press on the **RESET** key.	□	CYCLE/Pr:001 PRESS = 20 mbar READY

3.3. PIEZO RESET

Allows the carrying out of a forced reset to 0 on the piezo sensor.

In the main menu, place the cursor in front of the **SPE CYCLE** heading and confirm with the **ENTER** key.	▽ ↵	MAIN MENU RUN PROG. : 001 PARAMETERS ▶SPE CYCLE: Disabled
Next, place the cursor in front of **Auto-zero Piezo** and confirm with the **ENTER** key.	▽ ↵	SPE CYCLE Disabled Infinite fill ▶Piezo auto zero
The display confirms that the special cycle is selected.		MAIN MENU RUN PROG.: 001 PARAMETERS ▶SPE CYCLE: Piezo Az
Press on the **START** key to start the auto zero.	▷	CYCLE/Pr :001 PRESS = 355.5 mbar AUTO ZERO
Once the auto zero is carried out, the cycle stops on its own.		CYCLE/Pr :001 PRESS = 355.5 mbar READY

***Note**: the auto zero cycle is an automatic cycle which is carried out about every 5 minutes, it allows the initialisation of the pressure sensors depending on the atmospheric pressure.*

***Note**: In the event of the installation of an electronic regulator, the auto zero cycle allows the calculation of the three characteristic points of the regulator (points at 20 %, 50 % and 80 % of the maximum pressure which may be supplied by the regulator, value depending on the supply pressure at the input).*

4. RESULTS MENU

This function allows:

- ✓ The display of the test results detail: number of parts tested, number of good parts, number of bad parts, rise error, drop error, warning, pressure error.
- ✓ The resetting of the results memory,

5. MENU LANGUAGE

This function allows the choosing of the instrument language.

Two languages are available including English.

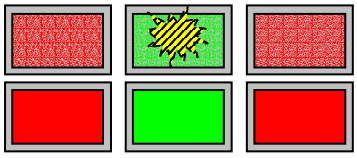
6. STAND-BY MENU

This function allows the switching off of the instrument without unplugging it from the mains power supply. The switching to stand-by can be immediate or programmed with hours of operation and hours of rest.

The immediate switching to stand-by can be carried out in two different ways:

1) Either through the Stand-by menu,

2) Or by pressing for more than three seconds on the **RESET** button.

***Note**: when the instrument is on stand-by the display is switched off and only the yellow indicator emits flashes about every 3 seconds.*		
To reactivate the instrument just press on any of the front panel keys.		ATEQ ERD5 Version XX.XXi 0->500 mbar Flow F.Sc : 30l/h

☞Select the option and proceed to adjust if necessary.

6.1. STANDBY USING THE MENU

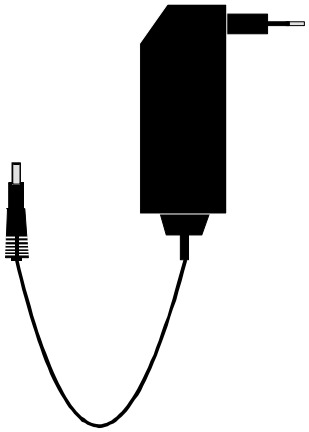
Standby using the menu enables start and stop times for the instrument to be programmed.

In the main menu, position the cursor beside **STAND-BY** and confirm by pressing **ENTER**.	▽ ↵	MAIN MENU RESULTS LANGUAGE : English ▶STAND-BY
To program automatic standby at a given time, position the cursor beside **STOP TIME.**	▽ ↵	STAND-BY Now : No Start time : No ▶Stop time : No
Confirm the **STOP TIME** parameter using **YES**	▽ ↵	STAND-BY Now : No Start time : No Stop time : Yes ◀
Then set parameters for the time (hours and minutes) when the standby must take effect. **TIME DELAY** is the delay (in minutes) between the programmed time and actual standby	▽ ↵	STAND/Stop time HOUR : 00 ◀ MINUTE : 00 Delay : 00
To program the start-up time for the instrument, position the cursor beside **START TIME**	▽ ↵	STAND-BY Now : No ▶Start time : Yes Stop time : Yes
Confirm the **START TIME** parameter using **YES**	▽ ↵	STAND-BY Now : No Start time : Yes ◀ Stop time : Yes
Then set parameters for the instrument start time (in hours and minutes).	▽ ↵	STAND/Start time HOUR : 00 ◀ MINUTE : 00

Chapter 5
ACCESSORIES

1. ACCESSORIES DELIVERED WITH THE INSTRUMENT

1.1. POWER SUPPLY



The power supply of the **ERD520** converts a network power supply (120 to 240 V AC) to a low voltage 24 V DC power supply. Without any switch, the power supply is operational as soon as it is connected to the mains. It is protected against surges and short circuits with a thermal fuse (do not use any other type of fuse).

2. OPTIONAL ACCESSORIES

2.1. FLOW MASTER LEAKS

The flow master leaks are used to check the calibration of flow measurement instruments. They are delivered in a case, attached to a connector which depends on the value of the flow are delivered with a calibration certificate.

	Nozzle type/flow in dm^3/h (air to 15°C and 1013 mbar)						
PRESSURE	**10**	**20**	**35**	**59**	**80**	**112**	**160**
2 kPa (20 mbar)	0,98	5	17	51	93	180	405
10 kPa (100 mbar)	2,64	13	40	117	221	387	922
25 kPa (250 mbar)	4,36	21	64	185	354	607	1473
50 kPa (500 mbar)	6,54	29	90	262	482	890	1947
100 kPa (1 bar)	9,6	43	129	372	676	1262	
150 kPa (1,5 bar)	12,4	54	162	468	850	1599	
200 kPa (2 bar)	15,0	65	194	545	1010	1909	
250 kPa (2,5 bar)	17,7	76	227	638	1185		
300 kPa (3 bar)	20,4	88	260	729	1357		
350 kPa (3,5 bar)	23,4	100	293	819	1524		
400 kPa (4 bar)	25,2	110	325	910	1694		

***Note:** the values displayed in the table above are given for information purposes; in effect the value of the standard leaks can vary by +/- 15%. The real flow rate of each master leak is accurately measured and given with an accuracy of +/- 1,5 %.*

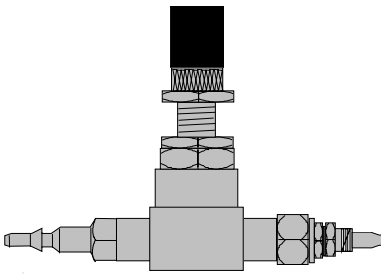
The master leaks:

- ✓ must be used with clean and dry air.
- ✓ must be stored in there boxes when not in use.
- ✓ must be periodically cleaned in acetone or trichloroethylene.
- ✓ must be checked periodically, to guarantee there accuracy (our metrology laboratory can carry out this service).

Option: a second master leak can be integrated if requested for the eventual control of the first or to replace it during a check.

2.2. NEEDLE VALVE AND LEAK FLOW CALIBRATOR

2.2.1. Needle valve

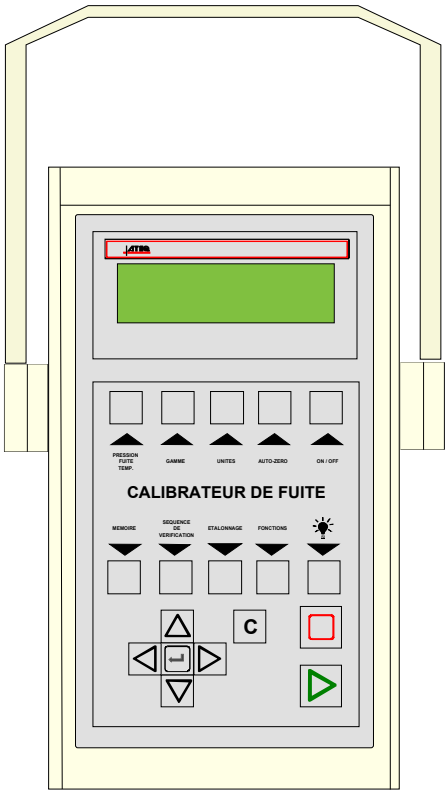


Needle valves are used to calibrate the leakage limits. These valves have an adjustable leak and depending on the model allow adjustments of between a few cm^3/h to several l/min.

These valves can be easily disturbed and therefore require the frequent use of some means of checking the setting (eg: ATEQ Leak/ Flow calibrator).

***Note:** it is strongly recommended that you do NOT leave a needle valve permanently connected on a leak detection machine with automatic calibration every « n cycles ».*

2.2.2. CDF (Leak/Flow Calibrator)



The **Leak/Flow calibrator** is a multiple range **ATEQ** flow meter intended for checking leak testing equipment and particularly **ATEQ** instruments. It measures a loss of charge with a differential sensor, which is connected to a calibrated flow tube.

2.3. AUTOMATIC CONNECTORS WITH EXPANDABLE JOINTS

ATEQ automatic connectors are used so that accurate and reliable assemblies can be built to check air tightness. They simplify the work of the operator as they are self-locking thanks to the use of a pneumatic valve supplied from the mains compressed air supply. Several connectors may be controlled by the same remote, powered by an **ATEQ** or another logic.

They adapt easily to a large number of fittings and apertures of varied dimensions. Their use ensures that non-machined walls can be guaranteed airtight.

There are four basic versions of **ATEQ** automatic connectors:

- ✓ SA for external connections,
- ✓ SI for internal connections,
- ✓ SAG and SIG for threaded and tapped connections.

They are either in anodised aluminium or stainless steel as standard. Different types of joints are available depending on the elasticity required.

2.3.1. Operation

The connector is positioned manually or automatically using a jack or cylinder.

Compressed air is allowed through the control aperture via a three part valve. The pressure pushes the cylinder which squashes the connector. The air tightness is therefore perfect and there will be no leakage in the connector seals.

2.3.2. Standard dimensions

SAG and SIG have been designed for threaded and tapped caps. For the time being, they are available in gas norm. Sizes, which are: 1/2", 3/4", 1", 11/4", 11/2", 2", BSP.

The SA and SI are designed for smooth nozzles, with dimensions from 3 to 80 mm for the external diameters (SA), and from 10 to 75 mm for the internal diameters (SI).

2.4. FILTRATION KIT

For an increased reliability of the instruments, it is necessary to use clean and dry air.

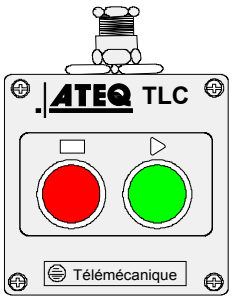
The filtration kit is connected to the air input on the rear panel of the instrument.

It is composed of a dust removal cartridge (5µm) and another cartridge (0,01 µm) to reduce the residual oil pollution to 0,01 ppm.

2.5. REMOTE CONTROLS

The remote control allows control and selection of various settings remotely for instruments in the **ATEQ** range. The remote is to be connected on the Input/Output connector.

2.5.1. Reset/Start casing



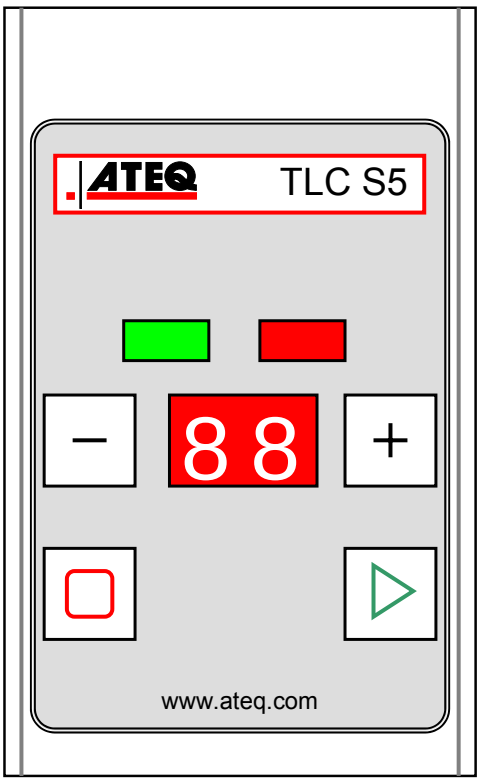
2.5.2. 4 functions S5 remote control

This remote control has four functions which can be used to control a series 5 instrument remotely. (F580 or C540 single head only).

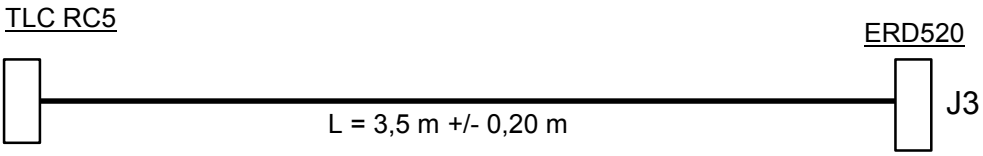
The four functions on this remote control are as follows :

- ✓ RESET and start cycle.
- ✓ Increase or decrease program numbers.
- ✓ Display the number of the program selected.
- ✓ Display the test result, green indicator light for Pass, red indicator light for Fail or alarm.

***Note:** a program number can only be changed (increase or decrease) when no test cycle is running.*



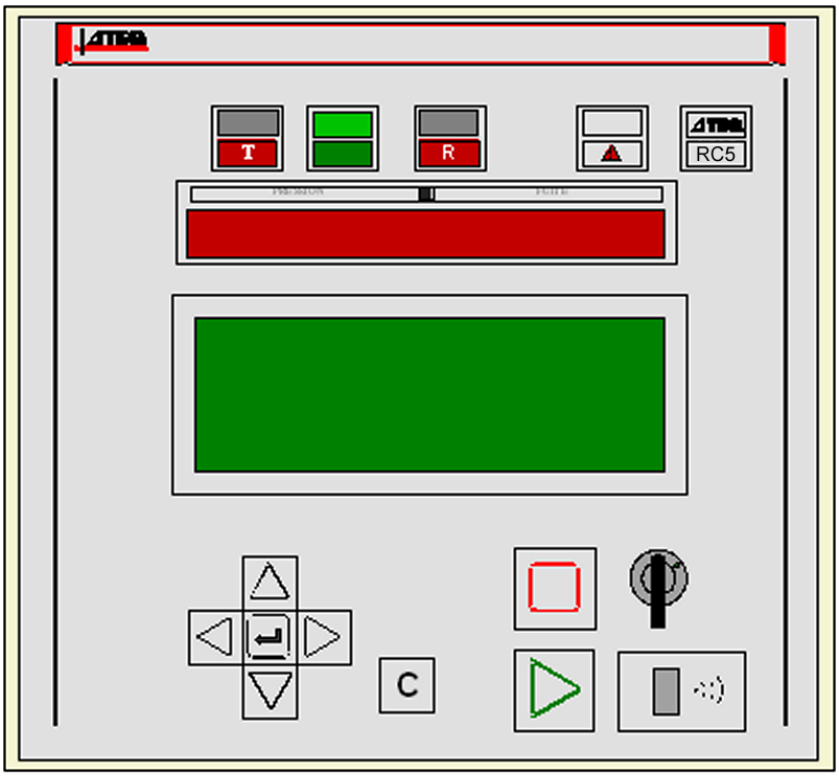
2.5.2. 1) Connection details



2.6. REMOTE FRONT PANEL RC5

2.6.1. Presentation

This option allows the placing of the control station in a different place than the control instrument; it allows the remote control and reading of results. This is useful when the measurement instruments have to be positioned in inaccessible locations, such as inside a machine to reduce the lengths of piping between the instrument and the test part.



This front panel acts exactly as if the operator was in front of the instrument itself. For the interface, refer to the global operation of the instrument.

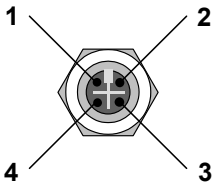
This remote control is optional. It is connected to the LUMBERG type connector reserved for remote controls. It is of "plug and play" type, the instrument automatically detects it, and the “REMOTE CONTROL" menus appear if the RC5 remote control is connected.

When the remote control is installed, its keyboard obtains priority over the control instrument’s keyboard which becomes inactive.

2.6.2. Installation

2.6.2. 1) Connect to the measurement instrument

a) J5 RS485 connector (remote control)

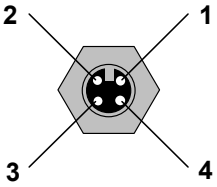


Allows the connection of an intelligent remote control. (Female Lumberg type connector). Optional.

PIN 1	Network
PIN 2	Power supply + 24V
PIN 3	Network
PIN 4	Ground 0V

2.6.2. 2) Connector on the RC5

a) RS485 connector (Input)



Allows the connection of the option to the remote control input of the **ATEQ instruments**. (Male Lumberg type connector).

PIN 1	Network
PIN 2	Power supply + 24 V
PIN 3	Network
PIN 4	Ground 0V

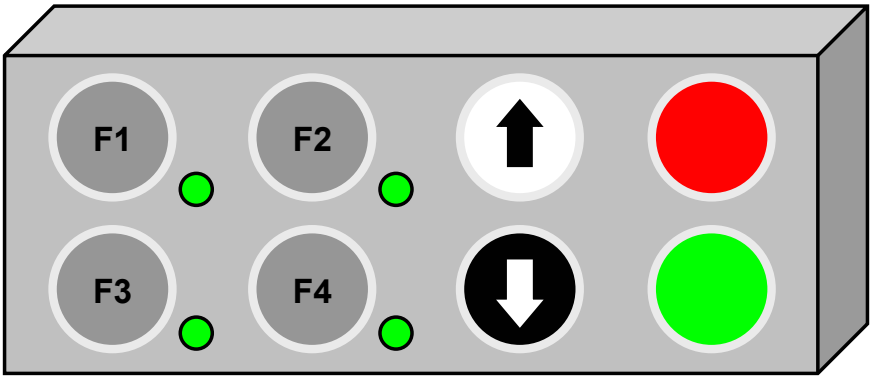
2.6.3. Start-up

Before connecting the instruments, turn them off, when the network is installed it automatically detects the presence of the RC5 remote front panel when the instrument is switched on.

If the remote front panel is equipped with a multifunction intelligent remote control (8 keys) refer to the paragraph concerning this accessory.

2.7. INTELLIGENT REMOTE CONTROL

2.7.1. Presentation of the remote control



The remote control allows the remote operation and selection of various functions of the instrument in the **ATEQ** range.

This interface can only be installed with an RC5 type remote front panel with the intelligent remote option.

2.7.2. Programmable keys

This remote control is fitted with four function keys (F1, F2, F3 and F4) which can be programmed by the operator to fit his requirements (four buttons on the left). When a special cycle is used on a function key, it no longer appears in the menus for the other function keys.

The programmable functions are all the special cycles and the cycle start (the cycle start function allows the simulation of a two handed remote control).

Note: the synchronisation between the two buttons is of 300 ms, the two handed remote control is not a high security function, the ATEQ company would in no event be responsible if an accident should occur on an operator following its improper use.

2.7.3. Programmable cycles

The programmable special cycles on the function keys F1 to F4 are the following:

Disabled.

Regulator adjustment.

Infinite fill.

Piezo Auto-zero.

Calibration check.

CAL learning.

CAL check.

ATR learning.

Start.

2.7.4. Indicators

The L.E.D. tricolour indicators situated near the F1 to F4 keys allow the display of the state of the cycle requested:

- **green**, cycle ok,
- **red**, cycle bad,
- **orange** cycle in progress.

2.7.5. Fixed function keys

The four other push to make buttons (situated on the right hand side) are the push buttons possessing the following functions:

- selection of the rise program (white),
- selection of the drop program (black),
- cycle start button (green),
- cycle stop/reset button (red).

Reminder: these buttons functions are fixed and cannot be modified.

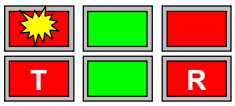
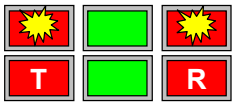
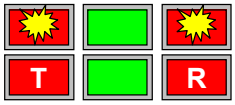
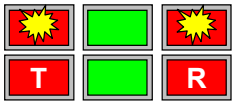
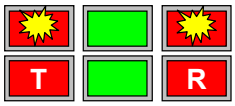
2.7.6. Installation of the remote control on the RC5

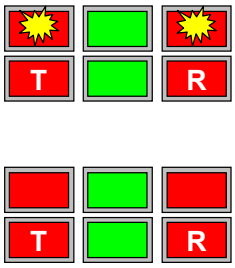
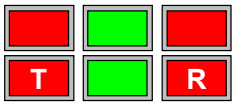
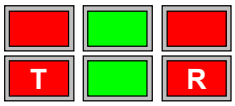
	J2 connector (outputs)		J3 Connector (inputs)	
Pins	**24 V 10 mA Outputs**	**L.E.D.**	**Inputs**	**Functions**
1	Green anode	F1	Input 1	F1
2	Cathode (0 V)		24 V	
3	Red anode		Input 2	F2
4	0 V		24 V	
5	Green anode	F2	Input 3	F3
6	Cathode (0 V)		24 V	
7	Red anode		Input 4	F4
8	0 V		24 V	
9	Green anode	F3	Input 5	RISE
10	Cathode (0 V)		24 V	
11	Red anode		Input 6	DROP
12	0 V		24 V	
13	Green anode	F4	Input 7	RESET
14	Cathode (0 V)		24 V	
15	Red anode		Input 8	START
16	0 V		24 V	

Chapter 6

ERROR MESSAGES

The **ATEQ ERD520** can display error messages if there are operational problems.

PROBLEM	LIT INDICATORS	MESSAGE DISPLAYED
Test error: Leak in excess of the full scale **Action**: check the test circuit.		CYCLE/Pr001 PRESS=0.942 bar FLOW =>>TEST F. Sc. READY (NOK)
Pressure in excess of the full scale **Action**: decrease the pressure using the mechanical regulator knob or the target if an electronic regulator is used.		CYCLE/Pr001 PRESS = > F. SCALE READY (NOK)
Error on the differential sensor. **Action**: contact ATEQ after sale dept. for repairs (probable presence of water or oil in the test circuit of the instrument).		CYCLE/Pr001 PRESS=0.942 bar FLOW= SENSOR ERR READY (NOK)
Pressure in excess of the maximum threshold **Action**: check the adjustment of the regulator, the pressure thresholds and the selection of the appropriate regulator in the event of a double regulator configuration. .		CYCLE/Pr001 PRESS=1.02 bar P> READY (NOK)
Pressure inferior to the minimum threshold **Action**: check the network pressure, and check the regulator adjustment, the pressure thresholds, the selection of the appropriate regulator in the event of a double regulator configuration. .		CYCLE/Pr001 PRESS=0.000 bar P< READY (NOK)

PROBLEM	LIT INDICATORS	MESSAGE DISPLAYED
1) The electronic regulator has been unable to initialise correctly. **2)** The input pressure on the regulator must be at least 10% of the regulator full scale + 100kPa (+ 1 bar). **Action**: check supply network pressure or pressure at the regulator input.		The indicators lit up for a short time after the display of the following message: REGULATOR ERROR
PROG error, the I/O's have selected a program with less parameters. **Action**: enter program parameters.		CYCLE/Pr.:009 ERROR
Inappropriate size for the selected unit of pressure. **Action**: change unit or modify the minimum and maximum pressure limits if these and the test pressure can be used with this unit.		PARAM/Pr001 >Press.unit : mbar MAX FILL : PPPP MIN FILL : 0.0

Chapter 7
OPERATIONAL PROBLEMS

1. PHENOMENON NOTED

If a test machine begins to detect too many bad parts (statistically, more than three consecutively), it is advisable to carry out a **check on the whole unit.** The quality of the manufacture and operation of the leak detector should be the last things considered.

1.1. CONDITION OF THE MACHINE'S SEALS

This is the no.1 defect as the seals are subject to high levels of dirt contamination (alumina, shavings). Regular cleaning of the seals is an effective remedy.

1.2. DAMAGED INSTRUMENT SEALS

There is a possibility that the seals may be cut by shavings or worn by repetitive squashing. This can be prevented by regular servicing and replacement of the seals.

1.3. BUMPER PAD

This is a defect which may occur after a certain amount of time as the bumper pads may be worn, or if the pressure settings in the air cylinder are inadvertently disturbed. Check the stability of the measurement and that the bumper pads are correctly installed.

1.4. PNEUMATIC AIR SUPPLY TOO LOW

This anomaly can cause false measurements (large leaks or erratic measurements). The air supply to the cells must be higher than the minimum of 4 bar and it is essential that it is greater than the minimum test pressure of 1 bar. Also check that sealing connectors are being used correctly.

1.5. PNEUMATIC LINK

The link and reference pipes will age and break with time. The pipes and seals must conform to the required quality. **ATEQ** recommends the use of RILSAN PA11 pipes and AVS type joints.

1.6. ENVIRONMENT

A measurement may be affected by a variation in background temperature (sun, draughts, storage of parts outdoors, handling of the test part by the operator, ...).

The dampness of parts may cause errors in the readings (insufficient drying after washing, outdoor storage, condensation, presence of water in the fixture, ...).

1.7. CALIBRATION

ATEQ does not accept any liability in regard to calibrations and settings to its instruments which are not carried out by its own personnel.

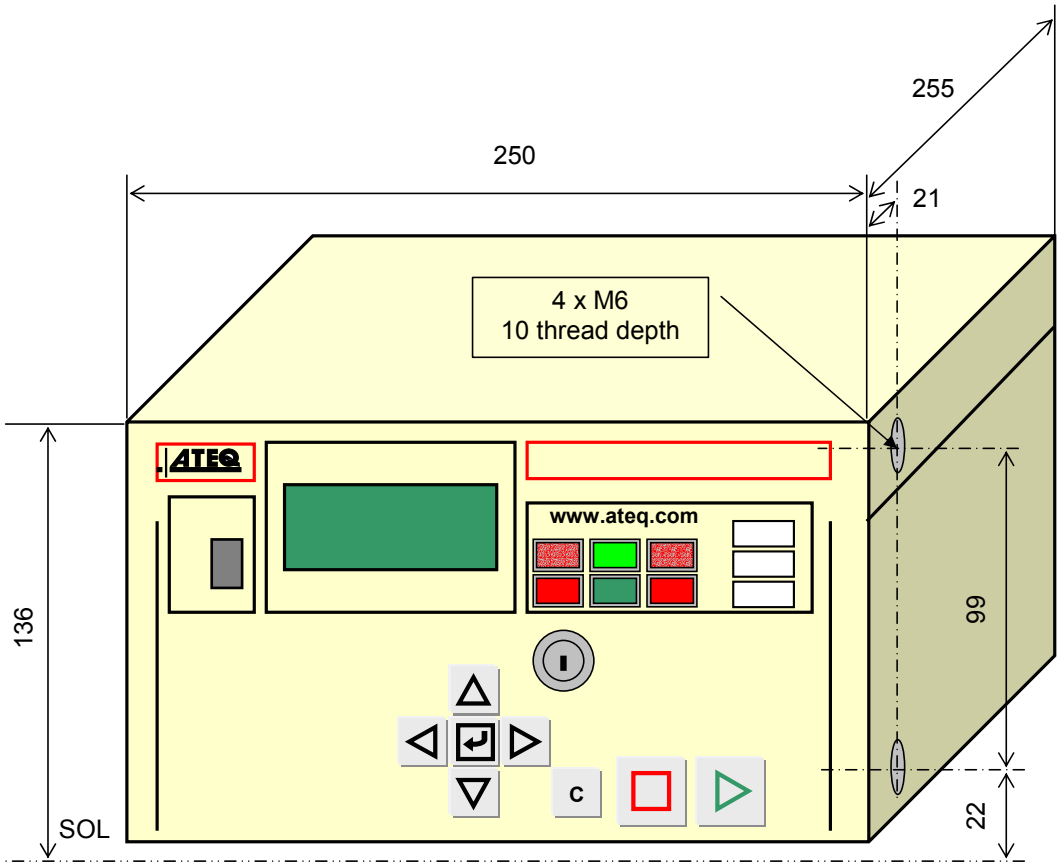
Appendicies

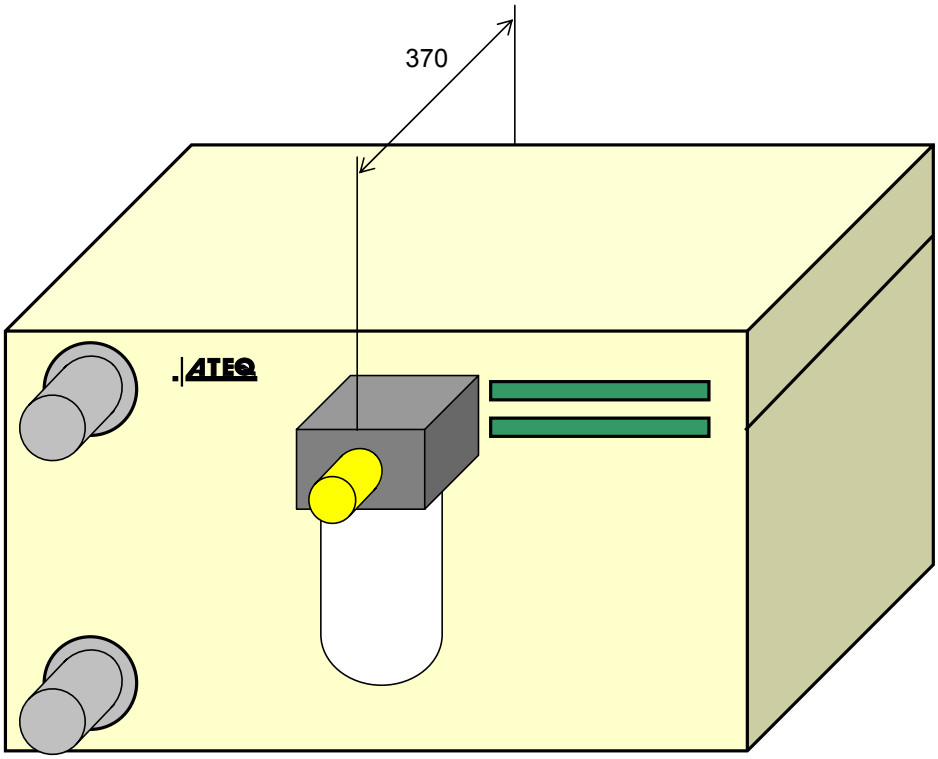
ATEQ ERD 520

1. TECHNICAL CHARACTERISTICS OF THE ERD 520

	ERD 520
Casing dimensions H x L x P (mm)**:**	136 x 250 x 255
Dimensions with air filter and regulator (mm)**:**	136 x 250 x 370
Power supply:	24 VDC / 2 A Min 23,5 V ; Max 28 V
Pneumatic connections:	3/5, 4/6 or 6/8
Weight (kg)**:**	about 4
Format:	½ 19 inches
Temperatures:	
Operational:	+10°C to +45°C
Storage:	0°C to +60 °C

2. MECHANICAL DIAGRAM OF THE ERD 520





3. CONVERSION TABLE

FROM \ TO	Pa	kPa	bar	mbar	mmH2O	atm	Torr	psi	inH2O	inHg
Pa	1	10^{-3}	10^{-5}	10^{-2}	0.10197	$9.8692 \ 10^{-6}$	$7.5 \ 10^{-3}$	$1.45 \ 10^{-4}$	$4.01 \ 10^{-3}$	$2.95 \ 10^{-4}$
kPa	10^{3}	1	10^{-2}	10	101.97	$9.8692 \ 10^{-3}$	7.5	0.145	4.01	0.295
bar	10^{5}	10^{2}	1	10^{3}	10197	0.98692	750	14.5	401.46	29.53
mbar	10^{2}	10^{-1}	10^{-3}	1	10.197	$9.8692 \ 10^{-4}$	0.75	$1.45 \ 10^{-2}$	0.401	$2.95 \ 10^{-2}$
mmH2O	9.806	$9.8067 \ 10^{-3}$	$9.8067 \ 10^{-5}$	$9.8067 \ 10^{-2}$	1	$9.6784 \ 10^{-5}$	$7.3556 \ 10^{-2}$	$1.4223 \ 10^{3}$	$3..937 \ 10^{-2}$	$2.895 \ 10^{-3}$
atm	$1.013 \ 10^{5}$	101.33	1.0133	1013.3	10332	1	760	14.695	406.78	29.921
Torr	133.32	0.13332	$1.3332 \ 10^{-3}$	1.3332	13.595	$1.3158 \ 10^{-3}$	1	$1.9337 \ 10^{-2}$	0.535	$3.937 \ 10^{-2}$
psi	6897.8	6.8948	$6.8948 \ 10^{-2}$	68.948	703.07	$6.8045 \ 10^{-2}$	51.71	1	27.68	2.036
inH2O	249,09	0.2491	$2.4909 \ 10^{-3}$	2.4909	25.400	$2.4583 \ 10^{-3}$	1.8683	$3.61 \ 10^{-2}$	1	$7.35 \ 10^{-2}$
inHg	3386.4	3.3864	$3.3864 \ 10^{-2}$	33.864	345.32	$3.3421 \ 10^{-2}$	25.4	0.491	13.595	1

4. PARAMETERS STORED

	PARAMETERS	Program n°	Program n°	Program n°	Program n°
TIME	Coupling time				
	Rise (UP) time				
	STEP				
	Drop (DOWN) time				
REJECTS	Test reject				
	Reference reject				
	Rise reject recovery				
	Drop reject recovery.				
	Reject unit				
PRESSURES	Initial pressure				
	Step pressure				
	End pressure				
	Max. step pressure				
	Min. step pressure				
	Min rise flow pressure				
	Max rise flow pressure				
	Min step flow pressure				
	Max step flow pressure				
	Min drop flow pressure				
	Max drop flow pressure				
	Pressure unit				
FLOWS	Minimum rise flow				
	Rise flow				
	Step flow				
	Max drop flow				

5. VALVE CODES USED IN YOUR APPLICATION

PROGRAM GROUP:

PROGRAM	VALVE CODE	FUNCTION
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15		
16		

6. PERSONAL NOTES

Index